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Journal of the Society of Arts.

FRIDAY, MARCH 12, 1858.

COUNCIL.

A Special Meeting of the Council was held on Wednesday last, the 10th inst., to consider the propositions published in last week's *Journal*, in reference to a proposed Exhibition in 1861. The discussion occupied the whole evening, and was adjourned to Wednesday, the 24th inst., when the Council will be specially summoned.

TENTH ANNUAL EXHIBITION OF INVENTIONS.

The days for receiving articles intended for exhibition are Thursday the 18th, Friday the 19th, and Saturday the 20th inst., and no articles can be received after the last of these days.

All articles should be accompanied with a brief but clear description of the invention, for insertion in the Catalogue, with a wood block (when possible) for illustration, and a reference to any publication in which the invention is described.

All drawings exhibited must be framed.

No charge is made for space, and the Exhibition is free.

EXAMINATIONS, 1858.

The Council have appointed the following gentlemen the Board of Examiners for the present year:—

Arithmetic.....	{ Rev. Alexander Wilson, M.A., National Society, London.
Book-keeping.....	{ John Ball, Esq., of the firm of Messrs. Quilter and Ball.

MATHEMATICS.

Algebra	{ Rev. Harvey Goodwin, M.A., Cambridge.
Geometry	{ Rev. B. Morgan Cowie, M.A., Professor of Geometry at Gresham College; one of H.M. Inspectors of Schools.
Mensuration	{ William Spottiswoode, Esq., F.R.S.
Trigonometry	
Conic Sections	

PHYSICS.

Navigation and Nautical Astronomy	{ John Riddle, Esq., F.R.A.S., Head Master of the Nauti- cal Schools, Greenwich.
Statics, Dynamics, Hy- drostatics	{ Rev. A. Bath Power, M.A., Principal of the Diocesan Training School, Norwich.

Practical Mechanics	{ T. M. Goodeve, Esq., Profes- sor of Natural Philosophy, King's College, London.
Magnetism, Electricity, and Heat.....	{ Charles Brooke, Esq., M.A., F.R.S., Surgeon to the West- minster Hospital.
Astronomy	{ Rev. Baden Powell, M.A., F.R.S., Savilian Professor of Geometry in the University of Oxford.
Chemistry	{ Dr. A. W. Williamson, Pro- fessor of Chemistry, Univer- sity College, London.
Animal Physiology	{ William Sharpey, Esq., M.D., F.R.S., Examiner in Uni- versity College, London.
Botany	{ Arthur Henfrey, Esq., F.R.S., Professor of Botany, King's College, London.
Agriculture	J. C. Morton, Esq.
Political and Social Eco- nomy	{ Charles Neate, Esq., M.A., Professor of Political Eco- nomy in the University of Oxford.
Descriptive Geography...	Wm. Hughes, Esq., F.R.G.S.
Physical Geography'.....	{ Rev. Samuel Clark, M.A., F.R.G.S., Principal of the Training College, Battersea.
English History.....	{ E. S. Creasy, Esq., M.A., Professor of History, Uni- versity College, London.
English Literature	{ Rev. F. Temple, M.A., Head Master of Rugby School.
Latin and Roman History	{ F. R. Sandford, Esq., B.A., Assistant Secretary to the Committee of Council on Education.
French	{ Alphonse Mariette, Esq., M.A., Professor of French, King's College, London.
German	{ Dr. Bernays, Professor of Ger- man, King's College, Lon- don.
Freehand Drawing.....	F. S. Cary, Esq.
Mechanical Drawing.....	{ Thomas Bradley, Esq., Pro- fessor of Geometrical Draw- ing, King's College, London, and Master at the Royal Military Academy, Wool- wich.

EXAMINATIONS.—LOCAL BOARDS.

The Committee of the London Mechanics' Institution have passed the following resolution:—

"That the Local Board of the London Mechanics' Institution, Southampton-buildings, is prepared to undertake the previous Examination of Candidates from any Society in Union with the Society of Arts not having a Local Board of its own."

ARTISTIC COPYRIGHT.

A Report as to the existing English Common and Statute Law, relative to this subject, has

been prepared at the request of the Committee, by D. Robertson Blaine, Esq., Barrister-at-Law, Reporter to the Committee, and may be obtained of the Society's publishers, Messrs. Bell and Daldy, Fleet-street. Price sixpence.

EXAMINATION PRIZE FUND FOR 1858.

The following circular letter has been addressed to the Members of the Society :—

Society for the Encouragement of Arts, Manufactures, and Commerce, Adelphi, London, W.C., Jan. 30, 1858.

SIR,—I am instructed by the Council to inform you that the Examination Prize Fund for 1858 is now opened. The donations for 1857 were contributed by twenty-three Members, and there is a small balance to carry forward.

The Council draw attention to the fact, that last year's Examinations were limited to two centres. At these two centres, pupils from thirty-seven Institutions only presented themselves; ten of them were from the metropolitan district, London being one centre; sixteen from Yorkshire, Huddersfield being the second centre, leaving but eleven for all England, Ireland, Scotland, and Wales. This unequal distribution was one of the reasons which satisfied the Council that the system was not adapted to meet the wants of all the Institutions. They, therefore, resolved to bring the Examinations to the very doors of the Institutions, by such step of course throwing open the prize fund to the students of every Institution.

The Council have also decided on contributing a certain mileage towards the travelling expenses of those candidates who desire to receive personally and publicly their prizes, and also £5 towards the travelling expenses of each pupil, who, obtaining three of the Society's certificates of the first class in the subjects contained in the Oxford programme, is desirous to contend for the degree of Associate at the Oxford Examinations. These changes lead the Council to believe that a considerably larger sum than last year will be required for the prizes, and I am, therefore, instructed to draw the attention of all the members to the circumstances.

Donations can be remitted to Mr. Samuel Thomas Davenport, Financial Officer, Society of Arts, Adelphi, London, to whom Post-office Orders should be made payable.

I am, Sir, your obedient servant,
P. LE NEVE FOSTER, Secretary.

The following is the list of Donations up to the present date :—

T. D. Acland, Member of Council.....	£ 5 5
John Ames.....	5 5
J. G. Appold, Auditor.....	10 10
T. H. Bastard.....	5 0
R. L. Chance.....	5 5
Harry Chester, Vice-Pres.....	10 10
Henry Cole, C.B., Vice-Pres.....	1 0
H. D. Cunningham, R.N.....	1 1
C. Wentworth Dilke, Vice-Pres. Chairman of Council (third donation).....	10 10
Thomas Dixon.....	1 1
Lieut.-Col. F. Eardley Wilmot, R.A.....	5 0
Lord Ebury.....	5 0
J. Griffith Frith, Member of Council.....	5 5
J. W. Gilbert, F.R.S., Treasurer (second donation).....	10 10
F. Seymour Haden (annual).....	2 2
William Haworth.....	1 1
Edward Highton (annual).....	2 2
James Holmes (annual).....	1 1
The Marquis of Lansdowne, Vice-Pres.....	20 0

George Lowe, F.R.S.....	1 1
The Master of the Mint, Member of Coun- cil (second donation).....	10 10
Sir Thomas Phillips, Member of Council ...	5 5
William T. Radford.....	1 1
Charles Ratcliff, Hon. Local Sec. (annual)...	10 10
Arthur Trevelyan.....	1 0
T. Twining, jun., Vice-Pres.....	10 10
Dr. J. Forbes Watson.....	1 1
G. F. Wilson, F.R.S., Member of Council (third donation).....	10 10

FALKIRK SCHOOL OF ARTS.

The following letter has been received from the Falkirk School of Arts :—

SIR,—At a meeting of the Directors of the Falkirk School of Arts, held on February 10, 1858, the following resolutions were unanimously adopted, and were ordered to be transmitted to the Secretary of the Society of Arts, London.

1. The Directors wish to remark, that the controversy which has recently occurred, connected with the system of Examinations in Institutions where class instruction exists, has caused their attention to be directed to the position and objects of the Institution with which they are more immediately connected, and to the relation which it holds, and the advantages which it derives, or might derive, from its connection with the London Society of Arts. The remark made in the circular from the latter, dated December 4, 1857, seems to the Directors of this Institution one of great importance, viz., that "the funds contributed by the Institutions in Union ought to be so expended by the Council of this Society as to afford to all parts of the Union, as far as possible, an equal amount of advantage." In unison with this sentiment the Directors of the Falkirk School of Arts would remark, that the principal object of the Falkirk School of Arts, since its commencement in 1827, has been to furnish to the inhabitants of the town and surrounding district annual courses of lectures on subjects of a literary and scientific character. At first these were, to a considerable extent, of a kind suited to the tastes and wants of mechanics. Gradually, however, it was found that the support given by this class to the Institution was too limited to enable it to exist, and the lecturers employed had to be changed—more of a generally popular element being studied in their selection. With this change the Institution revived, and has for a number of years gone on prosperously. The audience now consists of a fair mixture of the public generally, a considerable proportion being ladies. A syllabus of this year's course of lectures is enclosed, to show the class of lecturers which it is necessary to employ, in order that success may be ensured. A library was also, for many years, connected with the Institution, but experience taught the Directors that this was only a burden to them; for, on the one hand, they could not procure from the members sufficient funds to afford this, on its own account, proper support, and these funds had therefore to be drawn from what was realized from lectures; while, on the other hand, the lectures on this account necessarily became less attractive from the diminished remuneration that could be given to lecturers. In attempting to do two things, therefore, neither was done well. The conviction on this point became so strong, that for many years the library, consisting of six or seven hundred volumes, was locked up without being used, and latterly the whole was presented to a public library in the town, open to the public at a moderate rate of membership.

2. It will be seen, from what has been stated, that the Directors, after the experience they have had, now consider their vocation to consist in furnishing to their townsmen annual courses of miscellaneous lectures. In order

that these shall be successful, they have become aware that two conditions are necessary, viz., very moderate prices of admission, and a preponderance of first-class lecturers. The prices of tickets, for example, are this season 3s. 6d. for adults, and 2s. 6d. for young persons, while the sums paid to lecturers are respectively £4 4s. and £3 10s. per lecture, and £10 for each musical lecture, making an aggregate for the course, exclusive of three gratis lectures, of £60 12s., a sum the Institution could not pay without the contributions of honorary members.

3. From all that the Directors have been able to learn, as well from what they see in their own neighbourhood as from the information they have obtained, and the opinions they have heard expressed by the different lecturers who have visited them, a very large proportion of the flourishing country Institutions in Union with the Society of Arts are in a situation very similar to their own. If such be the case, it must be obvious to the Council of the Society of Arts that this and similar Institutions derive little or no direct advantage from their connection with the Society of Arts, and that with such the keeping up the connection, by the annual payment of £2 2s., must eventually, under these circumstances, become a question for consideration.

4. While such, the Directors candidly state, has hitherto been their experience, they have no wish to withdraw from the Union; but they would respectfully submit to the Council of the Society of Arts, whether it would not be possible to devise some means for lessening the expense of procuring first-class lecturers, a benefit which they feel would apply to every Institution in the country. Whether this could be done they do not presume to say; it is sufficient that they have indicated their position and the difficulties they have to contend with. They may mention, however, what the lecturers themselves have often remarked to them, that if continuous engagements could, by any arrangement, be procured for really first-class lecturers, a much smaller sum than is usually given would remunerate them better than what it is at present necessary to give, especially to those coming from a distance. Whether, also, railway companies could be induced to modify their rates to lecturers on their professional visits, is also, perhaps, a subject that might engage some attention.

In conclusion, the Directors of the Falkirk School of Arts would again beg respectfully to state, that their own pretty ample experience convinces them, that Institutions like their own will find, ultimately, that the lecturing department, when well managed, is that which is most attractive, and therefore the most remunerative and the most to be depended on; that it is unfair to this department that the funds to be derived from it should be diverted to other purposes, and that, in effect, the attempt to do so, will generally be found to injure both; and that any efforts of the Society of Arts to aid the Institutions generally, ought, in the opinion of the Directors of the Institution, to have especial reference to the procuring of first-class lecturers at a moderate rate. With such, the Directors have no fears for the success of their Institution, and without this they are afraid that it would be hazardous to ensure the continuous prosperity of any Institution, based, like their own, on the support of the public generally.

I am, &c.,

GEORGE HAMILTON, M.D.,
Secretary.

The following is the reply of the Council:—

Society of Arts, Adelphi, London,
10th March, 1858.

"SIR,—I am directed by the Council of the Society for the Encouragement of Arts, Manufactures, and Commerce, to acquaint you that the resolutions passed by the Directors of the Falkirk School of Arts, on the 10th February last, have been very carefully considered.

"The Council are always glad to receive, from the Directors of any Institution in Union with the Society of Arts, suggestions for increasing the advantages which the Society can impart to the Institutions; and the Council can neither expect nor desire that any Institution shall remain in the Union without receiving, directly or indirectly, a full equivalent for its annual payment of £2 2s. to the Society's funds.

"It should, however, be borne in mind, that the existence of the Union confers a *prestige* and an increase of strength upon the Institutions.

The very valuable provisions of the "Literary and Scientific Institutions Act, 1854," (17 and 18 Vict., c. 112) would never have been enacted if the Union had not existed. The members of the Institutions in the Union, when absent from their own neighbourhoods, can obtain access to nearly all of the other Institutions which the Union comprises; and, when in London, can attend the discussion meetings and lectures, and visit the exhibitions, of the Society of Arts, on the same terms as the Society's members. The *Journal* is supplied weekly, without charge, to each of the Institutions; they are supplied occasionally with specimens, photographs, and other articles, for temporary exhibition; they can purchase books, maps, and scientific apparatus at considerably reduced prices; they may confer on their members, as well as on their regular students, the advantages of admission to compete in the Society's examinations for certificates and valuable prizes; and they are furnished with arranged catalogues of lecturers, their addresses, subjects, and terms. The Council of the Society of Arts do not at all desire that all the Institutions in the Union shall be managed on the same plan, and promote exactly the same objects. A great diversity of objects and plans exists among them. The Council do not undervalue a well-arranged system of lectures; and, in the first years of the Union, the Council took much pains to assist the Institutes in this direction. The Council endeavoured to get the Institutes to make, or to enable the Society to make for them, combined arrangements with lecturers, with a view to the reduction of their travelling and other expenses, in order that the cost might be less to the Institutes. The Council hoped that such arrangements might be made, with mutual advantage to the Institutes and to the lecturers; but the Institutes could not be got to combine, and to agree, for this object; and the Conference of the Representatives of the Institutions came to the conclusion that nothing could then be done for them by the Society, in the matter of lectures, except to supply them with the arranged catalogues above-mentioned. It should be added, that the information which the Council have received from many quarters has tended to the conclusion that a large number of the Institutions are giving up lectures as unpopular and unfruitful of good results.

The Council, however, are of opinion that lectures, if they can be placed on a good footing, are not to be despised; and, if the representatives of the Falkirk School of Arts will bring this subject before the Conference, in June next, the subject shall have the best consideration which the Council can give to it. Nothing beneficial can be done, without the effective co-operation of a considerable number of Institutes.

Having made these explanations, the Council cannot but express their hope that the Falkirk School of Arts will find itself in a position to take an influential part in the very important educational work which is now extending itself throughout the Union in connexion with the Society's Examinations.

It is generally agreed, among the friends of popular education, that it is of the greatest possible moment to furnish motives and means for the continuance of instruction among the poorer classes, after the children have left their elementary schools. Such means are found not so much in lectures as in evening schools, and

in classes for systematic instruction in Mechanics' Institutions, Athenaeums, and Schools of Art; and such motives are found effectual in the periodical Examinations, Certificates, and Prizes, which the Society has introduced. Local Boards, to co-operate with the Society in this respect, are formed, and in course of formation, throughout England. There are five or six in London, and nine or ten in Yorkshire; besides numerous others in other places.

It is hoped that Scotland will not remain behind England in this great popular movement. Falkirk, surrounded by a large mining and grazing population, might, with advantage, be supplied with, and could easily establish and maintain, a good Local Board; and your lectures might then be really exceedingly useful, when preceded and followed by the more precise and extended teaching of systematized classes and evening schools.

I am, &c.,

P. LE NEVE FOSTER,

Secretary.

To Dr. Hamilton, Secretary, Falkirk School of Arts.

FOURTEENTH ORDINARY MEETING.

WEDNESDAY, MARCH 10, 1858.

The Fourteenth Ordinary Meeting of the One Hundred and Fourth Session, was held on Wednesday, the 10th inst., R. Wigram Crawford, Esq., M.P., in the chair.

The following Candidates were balloted for and duly elected members of the Society:—

Aston, Capt. Alex. Theo-	Dees, James
philus, R.A.	Schofield, Joseph

The Paper read was:—

COTTON: ITS CULTIVATION, MANUFACTURE, AND USES.

By HENRY ASHWORTH.

Clothing may be deemed coeval with the creation of man, and its necessity has been held to rank second to that of food. From the leaves of the fig tree, the skins of animals, and a variety of other natural products used as clothing, we have arrived at the adoption of the fibrous substances of wool, silk, linen, and cotton, and now we have superseded the contrivances of primitive manufacturing art, have advanced to the completeness and economy of the present period, and have established the superiority of cotton over every other known material, in regard to utility and comfort, as well as cheapness, for clothing.

The origin of the uses of cotton is very remote. Its production over many parts of the earth is spontaneous, and for three thousand years it has been wrought into garments by the people of India. This knowledge was also, at an early period, possessed by the people of Egypt and other eastern countries. In Spain it was known about the tenth century, and eventually it found its way to England. The Genoese were the first to supply this country with the raw material, probably from the Levant, and it is also probable that the Flemish emigrants introduced the requisite skill to use it.

The arts of spinning and weaving appear amongst the earliest inventions of our race. They are mentioned in the Scriptures, in the Homeric poems, and by Herodotus, Strabo, Arrian, Pliny, and other early historians. Yet, strange as it may appear, in past ages we find that no mention is made of any improved process. It would appear to have been reserved to modern times, and to the people of Lancashire, to subvert their rustic contrivances,

and to substitute the mechanical inventions of Hargreaves, Arkwright, and Crompton, as the basis of a manufacturing system. And it is from the period of these inventions that the successful career of our cotton manufacture may date its history.

Under the directing skill of our countrymen, the manipulation of cotton has been conducted with singular success in its adaptation to the various requirements of man, whether within the tropics, or in the colder countries of the north—whether for the people of Europe and America, or for the various oriental countries. The civilizing influence has been universally felt to be closely allied with the progress of our manufactures and commerce, extending not only throughout these islands, but throughout the world at large. The material benefits conferred, and their distribution, we may proceed to consider, and let us record the gigantic strides of progress, and the extent to which our manufacture of cotton has now arrived.

This will be seen by reference to the following account of the quantities of raw cotton consumed. Beginning with the year 1701, and proceeding to 1764, the date of the first improvement in spinning, we find an annual import of cotton of from one to two millions of pounds, which was, to a large extent, consumed as candlewicks. Proceeding from the first germ of invention, 1764, to the year 1856, which was the last year of full employment, and we find the following returns:—

Cotton consumed in	1764	.....	3,870,392 lbs.
	1785	.....	17,992,888
	1790	.....	30,603,451
	1800	.....	51,594,122
Quantity of Cotton con-	1810	.....	123,701,826
	1820	.....	145,648,617
sumed after Ark-	1830	.....	255,426,476
wright's Patent had	1840	.....	454,990,492
	1850	.....	688,200,000
expired, in 1785.	1851	.....	648,800,000
	1852	.....	745,000,000
	1853	.....	734,000,000
	1854	.....	780,000,000
	1855	.....	835,000,000
	1856	.....	920,000,000

Following an increase so enormous in the manufacture of cotton, the inquiry will almost necessarily arise, how has it been disposed of? The table relating to the exports of the year 1853, is unusually explicit, showing that, after having retained in this country large supplies for our own use, the excess of our productions has enabled us to meet the demands of about seventy other countries, to an extent, in value, of £32,712,900.

At the commencement of our manufacturing career (1767), the population of Great Britain was 8½ millions, and now it has reached 21 millions.

It will be admitted that, without the aid of the manufacturing art, it would have been impossible for so enormous an increase of the human family to have been provided with clothing or food.

The table referred to also shows, that not only have we provided these increasing millions of our own countrymen with cheap clothing, but that we have, also, during that year, exported to other parts of the world, as much in value as 15d. per head, if so distributed, for each of the 878,000,000 of inhabitants who constitute the entire population of the earth.

As before stated, the export of cotton manufactures for 1853, was.....	£32,712,902
The value retained for home use, which amounts to 15s. 5d. per head of population.....	£21,224,494
Total value of cotton manufacture for 1853.....	£53,937,396

Taking in like manner 1856, cotton manufactures exported	£38,284,000
The value retained for home use	23,200,000
Total value of cotton manufactured for 1856	£61,484,000
Increase in three years	£7,546,604
From the total value of cotton manufactures produced in 1856, say	£61,484,000
We have to deduct the cost of the raw material	23,958,000
Thus leaving in this country the sum of	£37,426,000

being the trading advantage which has been distributed as profits, wages, rents, cost of fuel, use of machinery, interest of capital, freight, carriage, and for every article of every kind derived from the resources of the nation.

The number of persons employed in the cotton factories of the United Kingdom in 1856, was—

In England and Wales	341,170
„ Scotland	34,698
„ Ireland	3,345

Total 379,213

Every worker is considered to represent three non-workers.

The above are those employed within the factories, and they are only a small proportion of those employed in all the other branches of the cotton manufacture which are not subjected to factory inspection.

Their numbers appear small in comparison with the vast extent of their productive power, affording the most striking evidence of the triumph of mechanical art, and serving also to display the physical advantages which have accrued to the working-class from having the operations of manual labour consigned to the power of the steam-engine.

Those employed in all our woollen, worsted, linen, and silk factories, are 303,284.

The increase of population is generally considered an evidence of the prosperity of a country. This has been enormous, more especially in the principal towns and seats of industry.

Taking the county as a whole, agricultural and manufacturing, the increase has been as follows:—

Population of Lancashire, 1750	297,400
„ „ „ 1801	672,565
„ „ „ 1851	2,031,236

Thus it appears that, from a period a little before the invention of the spinning process, the population of the county, as a whole, has multiplied itself by seven.

It has been estimated that, within an area of 30 miles round Manchester, the population exceeds that of the like area around St. Paul's. All this mass of people, although not in immediate connexion with the manufacture of cotton, are ministering, in one way or another, to its requirements, in bleaching, dyeing, printing, or otherwise preparing the articles for sale, or in the distribution of them for consumption.

Other departments of trade, which are necessarily connected with the cotton manufacture, are also extensively carried on, such as the manufacture of chemical preparations, engineering, machine making, building, &c., &c.; wholesale and retail dealers of every kind, besides the numberless little trades which exist on thriving industry, in addition to the interests of agriculture and shipping. By way of survey of the advantages thus derived to Lancashire, beyond those of a trading character, let us take an estimate of the social progress of the people—review the succession of rapid changes in the aspect of the country, and the amazing increase which has taken place in the value of landed estates, coal mines, &c., perhaps unparalleled in extent in this or in any other country.

Camden, in his survey of 1607, speaks of Lancashire as lying “beyond the mountains, towards the Western Ocean,” and appears to regard it not only as a foreign, but as hardly a civilized, country. It has been in this unpromising locality that manufactures and commerce have found a genial soil, and in the hands of this race of people, so dreaded by the early historian, that the sciences of mechanics and chemistry have been applied to manufacturing industry, with a practical intelligence unrivalled, and previously unknown.

The rivers which obstructed the Norman conqueror in his march through the district of South Lancashire are now employed in propelling machinery in bleaching, dyeing, and printing our fabrics, and are crossed with bridges and viaducts, for our roads and railroads. The morasses and woods of the country have been rendered fertile by cultivation, and no inconsiderable portion of the surface has been converted into large towns and populous villages, or applied to trading purposes, yielding to the proprietors a largely increased rental. Camden also speaks of the existence of several large towns, and mentions “Litherpoole,” as the most convenient and usual place for setting sail to Ireland; but there are many towns, such as Ashton, Bolton, Oldham, Salford, &c., &c., now containing from 20,000 to 100,000 inhabitants, which are not even noticed as existing.

At Liverpool, the changes, as measured by the population, are as follows, taking the Census previous to Camden's survey:—

Say	1555	Population was	138
„	1693	„	4,851
„	1760	„	25,787
„	1801	„	77,708
„	1821	„	118,972
„	1831	„	165,221
„	1841	„	223,003
„	1851	„	258,346

The above relates to the parish only, but if the adjoining townships or component parts of the town are included, the population will be 376,065, besides about 12,000 seamen. The increase of merchandise and shipping has been equally progressive.

Year.	Vessels.	Tonnage.
1764	1,625	Not stated.
1800	4,746	450,060
1810	6,729	734,391
1820	7,276	805,033
1830	11,214	1,411,964
1840	15,998	2,445,708
1850	20,457	3,536,337
1857	23,032	4,645,362

The increase in the value of property is universal. We will therefore take the county as a whole, including land under cultivation and waste, as well as towns, and referring to the land-tax returns of 1692, the annual value was £97,242. The valuation of 1853 for county rate was £6,913,073, showing an improved value of 7,000 per cent. The hundred of Salford, taken by the same valuation, shews in—

1692 the sum of £	25,907
1853 „ „	3,051,347

Or an increase of value of 11,700 per cent.

Without selection of individual towns we will take some of those which Camden does not appear to have discovered:—

	Annual Value in 1692.	Annual Value in 1853.
Ashton	£1,345	£150,370
Bolton	301	143,030
Oldham	287	119,669
Salford	809	159,328
Total	£2,742	£572,397

Or an increase of nearly 21,000 per cent.

art of embroidery. About the year 1790, the weaving of fine muslins, in imitation of the book muslins of India, was introduced into this city, and has increased very rapidly; afterwards, other fancy fabrics of the loom followed in succession, and the dyeing of Turkey red has become a very extensive and important branch of the cotton business. Calico printing has also been extensively cultivated, and the printed shawls of Glasgow are elaborate productions, and are supplied at a cost which is calculated to favour the million as consumers.

The embroidery of muslins, or the "sewed muslin trade," has assumed great importance, and has become extended from the country districts of Scotland to the north of Ireland. It has been stated by Dr. Strang, in a paper which he read in August last, before the statistical section of the British Association, that, in the neighbourhood of Belfast, the sewed muslin embroidery trade of Glasgow furnishes employment for about 200,000 women and girls, and that the richness and beauty of this work may be estimated from the fact, that a handkerchief, the ground of which costs 3s., may be rendered worth £8. The manufacture of cotton sewing thread is another branch of trade, which is extending in Glasgow and Paisley. Engineering, and other concerns of large magnitude, have been established, and the manufacture of chemical preparations, in connexion with the bleaching of cotton-goods, is largely carried on in Glasgow as well as in Lancashire.

HOSIERY.

The hosiery branch of the cotton trade of the counties of Derby and Nottingham is most valuable and useful. The domestic part of it is not subjected to inspection as the factories are, therefore the number of persons employed cannot be ascertained with accuracy, but according to an account taken in 1844 there were at that time employed from 50,000 to 60,000 hands, one-half of whom were women and children.

The statistics relating to progress are not easily found, but the extension and improvement of cotton spinning has led to an extension in the manufacture of stockings, from the year 1787 when the consumption of cotton yarn was 1,500,000; to 1812, when the consumption was 3,820,000; and 1857, when it had reached 9,450,000.

The amount of profits and wages annually derived from this department of trade, was computed, in 1844, at the sum of £1,335,000, and since that period the changes have been very great and very favourable.

The price of a pair of cotton stockings may range as high as 10s., or it may descend as low as 1½d., thus affording, at an easy expense, stockings to the feet of millions of people who never before have enjoyed that comfort.

The larger part of this labour is domestic, though the greatest share of the weight of cotton yarn consumed is in the factories where cheap stockings are made.

LACE TRADE.

The machine-wrought cotton lace trade is chiefly carried on in the counties of Nottingham, Leicestershire, and Derby. The number of persons employed may be computed at from 50,000 to 60,000, of whom the greater part are women and children, and the labour is largely carried on in factories; the rest is domestic or in the finishing warehouses.

The quantity of cotton yarn consumed, in 1857, was 6,050,000 lbs., of the value of £1,400,000, and the return of profits and wages has been estimated at £1,630,000. The total return for machine wrought cotton lace was, in 1857, £3,030,000.

In the earliest account we have of this manufacture, adaptations of the stocking frame were used for the making of lace. A large portion of these machines were superseded soon after the year 1809, by the patent machines of Mr. Heathcoat. At first there arose a violent conspiracy through the ignorance of the workmen, and a great many machines were broken by the mob. The success

which has since followed may be appreciated by reference to the following facts:—

Making lace of both kinds of material, i.e., silk and cotton—

In 1815 the number of machines at work was 140

In 1856 " " " " 3,500

And the total number of hands employed, 135,000, who are working upon silk and cotton inclusively.

In 1811, the population of Nottingham was 47,000

In 1856 " " " " 118,000

By reason of the superiority of these machines, and the reduction in the price of cotton yarn, the cost of a square yard of cotton lace has been reduced to from five pounds to sixpence, or nearly in a ratio of from one pound sterling to one penny.

SAMPLES SUBMITTED.

D. at 6d. per square yard; cost of 1 lb. of yarn...	s. d.
Its value as plain net.....	2 0
	8 0

E. at 8d. per square yard; cost of 1 lb. of yarn...	4 0
Its value as plain net.....	16 0

F. at 12d. per square yard; cost of 1 lb. of yarn...	7 0
Its value as plain net.....	24 0

The above qualities have been sold at 4s. 6d., and 8d. respectively, when the price of yarn was at the lowest point.

A. at 1s. per yard long } cost of 1 lb. of yarn £2	
B. at 1s. 6d. " " }	
Its value as finished lace	£9

C. at 7s. 6d. per yard long; the cost of	
one lb. of yarn.....	£17 to £20
Its value as finished lace	£170 to £200

The raw cotton for the above manufactures would cost from 1s. to 4s.; therefore, the profit and labour, use of buildings, machinery, &c., &c., upon 1lb. of cotton, has amounted variously from 7s. at the lowest to £199 16s. 0d. at the highest point of manufacture.

WORSTED MANUFACTURE.

Amongst the recent and most important of the advantages derived from cotton, has been its admixture with wool, mohair, alpaca, linen, and silk.

Of these mixed fabrics, the history of its success in the worsted trade of Bradford will be most deserving of our notice.

To begin with the origin of woollen garments, it may be remarked that, following the Roman conquest, our ancestors had begun to form their raiment from the fleece. From that time to the present, one of the leading characteristics of our progress has been luxury in dress. A succession of advances in the textile arts has introduced the wearing of every variety of animal and vegetable substance that could be fabricated by the loom.

About the time of Henry III., the art of weaving woollen stuffs had become established at a place called Worstead, in Norfolk. Afterwards the trade became settled at Norwich, where it grew into a manufacture of leading importance, and for several centuries, continued to flourish there. At length it approached the coal districts of the north, and became the staple trade of Bradford, in Yorkshire.

This manufacture of worsted stuffs served for female garments, especially for winter, and the damask for household drapery, but the wool of which it was composed did not admit of being wrought into light fabrics, such as the progress of national taste required. Hence, about 20 or 25 years ago, the prospects of this trade appeared very gloomy, so much so, that some of the manufacturers were in dread of its utter extinction. This demand for lighter fabrics in wool aroused the energies of the trade, and the

anticipated difficulty was overcome by the opportune discovery of a mode of admixture of a warp of cotton with a weft of worsted, and eventually with mohair, alpaca, or other substances, but principally with worsted, and the successful issue of this union has imparted new life, by the creation of a new branch of industry, in the worsted manufacture, and without inflicting entire extinction upon that which was previously in existence. The desired effect to be produced by this admixture of cotton and worsted has not been found difficult to accomplish in the loom. A warp of cotton is made to form the length of the piece to be woven, and the cotton threads, being much finer and stronger than threads of wool, receive within their meshes the weft of worsted shot across, and which, in many of the cloths, imbed themselves so deeply into the substance of the wool that the cotton portion of the web becomes completely hidden, and thus a fabric is constructed of little more than half the thickness and bulk that would have been presented to the eye if the length as well as the breadth of the piece had been of wool alone.

In this manner the desire of the consumer has been complied with, and, contrary to custom, instead of an increase of price, increased cheapness by the introduction of cotton has kept pace with the growing demands of taste and refinement. In the first instance, the completeness of this success was seriously impeded by the difficulty of dyeing the goods. The usual chemical process for the dyeing of wool did not answer when applied to a piece of cloth, which was composed of two fibrous substances so dissimilar in their nature, one being animal and the other vegetable. After a series of chemical operations more or less intricate, and after many praiseworthy efforts on the part of the dyers, this difficulty was overcome, and in the wide field of raw materials thus opened out there has been accomplished a most wonderful addition to the extent and variety of modern manufactures.

The principal articles of demand are known as mouselines-de-laine, Orleans cloth, Coburgs, Alpaca, mixtures, damasks, &c., &c.

The encomiums of the judges at the Great Exhibition upon the excellence of this manufacture will not be forgotten, and it may be truly said of this novel achievement, that it has introduced an array of female apparel which, for durability, cheapness, and beauty, stands unrivalled. It would be impossible to form any correct estimate of the advantages derived by those of every class, but, beginning with the wool-grower, we find that the introduction of cotton to the extent of half the piece, threatened not only a corresponding diminution in the use of wool, but also to render wool-growing less remunerative. The result has proved exactly the reverse; the attractions of the article manufactured, together with its comparative cheapness, have eventually called for more wool, and with this increase of demand, the price has greatly improved.

	lbs.	d.	£
British wool grown in 1857.....	143,042,782	at 19	11,322,219
do. do. in 1835....	108,000,000	at 13½	6,075,000
Since we have not the return of the price of wool in 1835, we will take the average price of the last 20 years, ranging as it does from 9½d. upwards, and averaging 13½d.			
Amount of advantage to sheep farmers			5,247,219

From the above account, it is evident that this change in the manufacture has been attended with an unexpected gain to the British wool-grower, by an increase of trade and higher price amounting to 5½ millions sterling. The same increase of prosperity and, to a larger extent, has been shared by the sheep farmer of Ireland, but the accounts are not clear, in consequence of large quantities of Irish wool having been sold for shipment to France, Belgium, and Germany.

The beneficial results to the mill proprietor, the operative class, and to all other trades, professions and pursuits, may be estimated by the increase which has taken place in the manufactories now existing, as compared with those in existence before the introduction of cotton. Worsted factories in the years—

	1838.	1856.	Increase.
Number of factories.....	415	511	96
Horse-power employed ...	7,166	14,481	7,315
Persons employed	31,606	86,690	55,084

Along with this increase of 55,084 of hands employed, we find also confirmatory evidence of prosperity in the general increase of population.

The population of Bradford in 1831 was	43,527
do. do. 1851 „	103,782

Owing to this creation of a new manufacture, our national industry has been greatly extended and improved, the profits derived from agriculture, as well as those of the manufacturers, greatly increased; more employment, higher wages, and, consequently, happier homes have been afforded to the operative classes; and, along with all this, an equivalent amount of comfort to the consumer. An immense enlargement of the town and contiguous parts of Bradford has resulted, and the aspect of the town has been adorned with dwellings and warehouses of an advanced style of architecture. It has now become the home and abode of many wealthy merchants, foreigners as well as natives; and, in all respects, there have been conferred upon the locality mercantile and social advantages of incalculable extent.

Bradford forms a centre of manufacturing industry, surrounded by Halifax, and many other towns and populous villages engaged in the same sort of pursuit, and all equally prosperous. The woollen cloth trade of the other manufacturing towns of Leeds, Dewsbury, Huddersfield, &c., &c., has shared, in like manner, the economy of the cotton warp, but not to the same extent as in the worsted trade of Bradford, although rapidly extending.

CONSUMERS' QUESTION.

The measure of economy as applied to clothing must depend upon the cost of the raw material, and the subsequent cost of its manufacture. For ordinary purposes the prices and attendant expenses may be taken as follows:—

	Expenses of Manufacture.	Cloth per lb.
1lb. of wool for flannel ...18d.	19d. or	8s. 1d.
1lb. do. for coarse cloth ...14	4s. „	5 2
1lb. of flax for shirting ...10	18d. „	2 4
1lb. of cotton for shirting.. 6	6d. „	1 0

Hence, not only the raw material of cotton, but the attendant expense of converting the same into cloth, is out of all comparison below that of wool, and only one-third of that of flax. Cotton as a raw material admits of being wrought into garments for the poor at the low sum of 6d. per pound weight, whilst, as before shown, a single pound of cotton worth 4s. can be made to furnish employment and wages to the extent of £200 in articles of decoration for the rich.

The material for a full dress of outer garments, if composed of wool, would cost not less than 30s., whilst the same quantity of material of cotton, and of more durable quality, would be 7s. 6d. to 10s. The labourer's wife may purchase from a draper a neat and good cotton print at 4d. per yard, and allowing 7 yards to the dress, the material would cost only 2s. 4d.

The current of reduction of price of cotton manufactures cannot be traced with accuracy throughout the period of the modern inventions in spinning, but the following cases of comparison are afforded:—

MR. ARKWRIGHT'S PRICES, EXTRACTED FROM AN INVOICE DATED AUGUST 12, 1784.

	s.	d.	In 1856.
No. 42 cotton yarn was	10	11	11d. per lb.
„ 50 „ „	15	11	12½ „

Other articles of cotton yarn—				
1786 the price of No. 100 was	38	0	...	2s. 6d. "
1795 " " 200 " "	51	6	...	8 0 "

At the same period—				
A wedding dress of calico, known to have been purchased at 6s. per yd.	} 2½d. "			
At the beginning of this century the price of No. 60 twist was 1s. over 1d. per hank, or 6s.				
	} 1s. 3d. "			

Taking the comparison at a later date :—

	In 1815.			In 1856.	
	s.	d.		s.	d.
Cotton yarn, No. 40 was sold at	2	8	...	0	11
" " 200 " "	26	0	...	8	0
¾ calicoes per yard	1	1	...	0	2½
" " printed	1	10	...	0	4½
¾ ell fustians, 4 oz. to the yard	1	10	...	0	6

The cheapness and utility of cotton have commanded for it a preference which is almost universal, not only for decoration and clothing, but for bookbinding, as a substitute for leather, and for other purposes.

The waste of cotton made during the processes of manufacture is wrought into coarse sheets and bed covers, which are sold at prices varying from 6d. to 9d. per lb.

The residue of the waste is used for the manufacture of paper, the cleaner portion being for writing paper, and the sweepings from the floors of factories supply a large proportion of the paper mills of Lancashire with the raw material of the paper which is used for the printing of books and newspapers.

SUMMARY.

We owe it to the genius of Hargreaves, Arkwright, and Crompton, subsequently aided by Watt, and carried into practical operation by the enterprising efforts of other men, that the previously obscure and humble pretensions of cotton have been raised from insignificance and invested with an importance truly national; that along with the progress of this manufacture, our population has increased beyond any previously conceived limits, the bounds of our industrial pursuits have been immensely enlarged, and the means of clothing have been rendered abundant and cheap.

Mines and minerals previously undiscovered have been rendered productive of profit to their owners; agriculture, shipping, and every other pursuit has shared in the general prosperity; indeed, it would be impossible to measure or to display by any detail of quantities, what has been the development of the national and financial progress of the country. Mr. Porter, in his progress of the nation, says, "It is to the spinning jenny and the steam engine that we must look as having been the true moving powers of our fleets and armies, and the chief support also of a long continued agricultural prosperity."

Thus far we have enumerated the advantages derived from cotton manufacture, but let us not overlook the fact that the manufacture of cotton is not now confined within the British dominions. It has become widely extended over other countries, and although we are still holding the supremacy, the aspect of increasing success abroad appears to menace its long continuance here. Fifteen years ago our machinery consumed two-thirds of the cotton raised, and now it is only one-half.

The following account shows the quantity of raw cotton consumed in the chief manufacturing countries in the year 1856 :—

	lbs.
Great Britain	920,000,000
Russia, Germany, Holland, and Belgium	256,000,000
France	211,000,000
Spain	48,000,000
Countries bordering on the Adriatic ...	39,000,000
United States	265,000,000
Sundries, Mediterranean, &c.	56,000,000
	1795,000,000

It is not the presence of foreign competition, even of the existing formidable extent, that would of itself be deemed sufficient to throw a shade over the future prospects of the British manufacturer. There is a sustaining reliance in the fact, that even now it is only about three-quarters of a century since the operation of spinning all over the world was done by the aid of one spindle.

The position of pre-eminence we now occupy has been attained by our energetic predecessors, who had emerged from pastoral life, and by ourselves their successors. It will not be attributed to those of our day, that the originality of our intellectual power in manufacturing skill is being exhausted; on the contrary, there is no lack of fertility of genius. It is, therefore, not unreasonable to look forward hopefully to an extension of that industry, if our political and other institutions are so regulated that they do not fail in their duty to commerce.

The soundness or unsoundness of our manufacturing prosperity has become an object of study, not to say of solicitude. That position which we now exult to look upon, either is, or ought to be, of a permanent character, and it would indeed be reprehensible in us if we were to shut our eyes to any appearance of danger lying before us. All the elements of continued prosperity are in our possession, save one only, and that is a most material exception, namely, the command of a regular and adequate supply of raw cotton. This constitutes the structural weakness, the "feet of clay" of our otherwise gigantic commercial power.

COTTON SUPPLIES.

In the early part of the present century, our supplies of raw cotton were received from upwards of thirty different parts of the world—countries from most of which we now receive none whatever; and, as a consequence, we are now dependent upon the United States for seven-ninths of our supply.

As a commercial question, it is a matter of indifference to the manufacturer or the consumer in what part of the world cotton may be grown; but in a national and economic point of view, the question of an adequate extent of growth is one of the utmost importance. It is desirable, if not absolutely necessary, that our supplies should be drawn, not from one source alone, but from a variety of sources, not only to secure greater regularity of supply, but as a provision against the inconvenience arising from scarcity and dearness, and possibly against other and still more serious disasters.

The cotton of the United States is admirably suited to all our wants. We have no indisposition to deal with the American people. We know that it is the desire, and not beyond the power, humanly speaking, of the planters of America to uphold the continuance of those supplies of which we have need, provided they could have an adequate command of labour, but this they have not, and, therefore, the extent of their growth is necessarily limited to the extent of negro labour on their plantations, as well as to the casualties attendant upon crops of every kind. It is known also, that the cotton-lands of the United States are limited in their extent, ranging across that country from 33 to 34½ degrees of north latitude, and that the cultivation of them is tending ultimately to their exhaustion.

The cotton-plant is exposed not only to the ordinary vicissitudes of good or bad seasons, but to disasters frequently arising from storms, and from the attacks of worms and caterpillars; nor ought we to overlook the uncertainties to be apprehended from a continued reliance upon slave labour, or from an atmospheric epidemic, such as the vine disease or the potato rot. These are considerations of serious moment, as affecting our reliance either upon America or upon any one single country.

A failure of slight extent has an immediate effect upon the price of cotton. An advance of one penny per pound

upon our present consumption of cotton, amounts to four millions sterling a-year; and the increase of price last year over that of ordinary years was about 3d. per lb., being at the rate of twelve millions of pecuniary outgoing from the British manufacturer to the cotton planter, which could not, except to a small extent, be recovered in the subsequent price upon the manufactured articles sold to the consumer. Recent experience has not been wanting of an apprehended dearth of cotton, and it is to be hoped that the warning thus exhibited may become of some avail hereafter in producing forethought for future supplies.

For several years past, the annually-increasing demand for articles made of cotton has stimulated the manufacture, and has thus gradually reduced the stock of raw cotton which is usually lying upon the market for sale. In the month of September last, this reduction had proceeded so far as to raise an alarm, and it was seriously contemplated that the stock of cotton would be entirely exhausted before the close of the year. This disaster was, for the time, provided against by the occurrence of mutiny in India and money-panic in America, which, together, closed two of our best markets for manufactures, and caused a seriously-diminished rate of consumption by the stoppage of mills; and, at the present time, the stock of American cotton in Liverpool is only equal to the consumption of three weeks, and the entire stock of all kinds is only equal to a consumption of four weeks.

The entire failure of a cotton crop, should it ever occur, would utterly destroy, and perhaps for ever, all the manufacturing prosperity we possess. Or, should the growth in any one year be only one million instead of three millions of bales, the manufacturing and trading classes would find themselves involved in losses which, in many cases, would amount to irretrievable ruin—millions of our countrymen would become deprived of employment and food—and, as a consequence, the misfortune would involve this country in a series of calamities, politically, socially, and commercially, such as cannot be contemplated without anxiety and dismay. Evidence of the existence of such an emergency makes a loud appeal to the nation. Already the subject has received attention from the manufacturers, and they have formed themselves into a Cotton Supply Association, for the purpose of diffusing information and encouraging the cultivation of cotton, and of communicating with those persons who might thus become interested in the prosecution of any new project for the culture of cotton.

They have ascertained that there are a great number of localities where cotton may be grown under favourable auspices in respect to soil and climate, but in almost every country there exist obstacles, local or political, which would render it inexpedient to raise the necessary capital for investment. The tenure of land would, in most places, be found insecure, and the pursuit would be subject to institutions which are of an unstable and shifting character.

One instance may be related as interesting and encouraging. By the instrumentality of an energetic and philanthropic individual, Mr. Thomas Clegg, of Manchester, there have been received from Western Africa, during the last year, 795 bales of cotton, besides which, there were 340 bales lost by a fire, making 1135 bales which had been prepared for market by the chiefs and other natives of that country, acting under the advice of our excellent consul, Mr. Campbell, of Lagos. This success, however encouraging in itself, will appear of little significance in a commercial point of view, seeing, that if this production was measured against the rate of our consumption, it would serve us just one hour. The fact of itself deserves our warmest appreciation, and indicates the power of the free negro to minister to his own comfort and to the world's progress; it is confirmatory, also, of the opinion of Dr. Livingstone, that, "Africa is the very territory for cotton."

INDIA: ITS GOVERNMENT AND CAPABILITIES.

In the East Indies we have a country to which hereafter we must look for large supplies of cotton, silk, and other valuable products.

For a long series of years the Manchester Chamber of Commerce, as well as many public-spirited individuals, in and out of parliament, have aroused the attention of the country to the dangers of our continued reliance upon the United States for so large a proportion of our cotton, and have not failed to insist upon the capabilities of India. The urgency of this subject they have unceasingly pressed upon the legislature, the government of India, and the public, and the present crisis in the affairs of India affords the opportunity of procuring the entire removal of every obstacle.

The extent and fertility of the lands of India show a capability of growth for cotton which cannot be questioned. Agricultural labour is to be had in great plenty, and at wages seldom exceeding one penny a day. The climate is free from those damaging frosts to which the cotton plant of America is subjected in the planting and the picking seasons. The plant, when supplied with moisture, yields most abundantly, and of excellent quality. Hence any quantity of cotton may be raised that we may require. It is known that India produced largely from the earliest ages, before a single bale had been grown in the United States, and with all the increase of territory in India, by annexations and otherwise, how is it that it has lagged so far behind?

Our Indian empire is considered to be equal in extent to the surface of all Europe, yet, whilst our most urgent wants of cotton could be supplied by the growth of a smaller surface than that of an English county, that which they have sent during the last 35 years has varied from 1-12th to 1-6th, averaging only about 1-8th, of the consumption of Great Britain. This deficiency will not be attributed to the inability of the country, or the lethargic indifference of the people to supply our wants. It will, therefore, be necessary to consider whether the policy of the government of India has been favourable or otherwise to production and progress. So far as can be gathered of the policy of the government of India, the effect has not been to encourage European enterprise and capital employed in the cultivation of the soil. Referring to the evidence submitted to Mr. Bright's Committee of 1848, it was stated that it was the policy of the government of India to frustrate rather than to encourage the efforts of the English merchants in any attempt to improve and fertilise the soil, and in a dispatch which was read before that Committee Europeans were expressly forbidden to purchase land in fee simple. Mr. Mangles, the Chairman of the Court of Directors, stated, in explanation of their dealings, that "Any Europeans may purchase land in any part of the Company's settled possessions; but of course Europeans can only purchase what any native has to sell. He cannot purchase the fee simple in the sense in which we in England speak of the fee simple. He cannot buy what a man has not to sell. The state throughout India has a lien upon the revenue of the land, which it cannot and ought not to part with, either in favour of the cultivator or any other party."

The government is virtually both sovereign and landowner. The improved security, so called, of tenure, is a lease of 30 years, which they will not allow to be transferred, and the land so held is liable to seizure, and the lease to forfeiture, at the discretion of a collector, and no judicial appeal is allowed if a sale or transfer be attempted without express permission.

According to the statement of Mr. Marriott, the proportion of land revenue collected ranges from one-third to one-half of the gross produce of the soil, and Mr. Mangles makes it even more than this. From the small amount of the salaries of the native collectors, and from the temptations of dishonesty, it has been attributed to them that they are not trustworthy. The Committee inquired of Mr. Mangles, "If the natives were well paid,

do you think they would be trustworthy?" His answer was very significant, "More trustworthy, certainly. The experiment has never been tried, but it ought to be tried." Mr. Mangles also made the astounding admission, "That while the company had, during the preceding 14 years, derived a revenue from India of £300,000,000, the entire sum spent during that same period in roads, irrigation, and other public works, amounted only to the sum of £1,400,000."

Mr. Henry St. George Tucker, formerly chief financial officer under the government of India, and then, in 1846, deputy chairman of the East India Company, says, "Will industry be called into action when the demand of the tax gatherer keeps pace with the produce? Will capital accumulate where there is no security for property; no law but that which is administered under the auspices of a revenue officer? Will opulent consumers be found where no capital is allowed to accumulate? And can any country advance and become prosperous where land has no saleable value; where there is no motive for laying out capital in improvement, and where no order of human beings is to be found between the Government and the labouring peasant?" "Certainly not."

Those who have described the condition of the people of India, uniformly concur in remarking upon the onward progress of destitution. Mr. Shore says, "Throughout the country we found flourishing villages and innumerable houses, inhabited by men who lived in the style of gentlemen, keeping up their establishments of servants, horses, elephants, and equipages. These are now falling into decay, while the owners or their descendants are dwelling in mud huts, with little more than the mere necessities of life."

Mr. Tucker, in a letter to Sir Robert Grant, describes the country as "verging to the lowest ebb of pauperism; that a large portion of the public revenue has been paid out of the capital of the country, small as that capital is in itself, consisting of jewels and ornaments of the precious metals, cattle and household utensils; in addition to this lamentable evidence of poverty is another of equal force to be seen in all parts of the country, in the numerous individuals of the above class wandering about for the employment of hirelings, which they are glad to obtain even for the most scanty pittance."

Mr. Chapman says, "that the agricultural population are so totally ruined and thrown into the hands of the money-lender, that they have, roughly speaking, to begin the world afresh every ten or twelve years."

Under this extreme poverty the cultivator, ground down betwixt the upper and the nether millstones of the tax-gatherer and the usurer, finds himself raising a crop of less than 100 lbs. of cotton to the acre, whilst the same culture under proper irrigation would have yielded him 400 lbs., and of a quality worth thrice the price per pound. The indigenous cotton grown without irrigation is dry, short, and dirty, and notwithstanding all the disadvantages under which the cultivator labours, the cost of production has been put down variously as ranging from 1½d. to 2½d. per lb.

At these prices the Indian could beat and undersell the American cultivator, but the affair of market competition does not rest upon growth alone; there is another and hitherto an insuperable difficulty and occasion of expense which has altogether deprived the cultivator in India of his advantage in first costs.

In the absence of roads, railways, canal or river navigation, his cotton has to be conveyed sometimes a sixty days' journey from the interior to the place of shipment, on the backs of bullocks, and after having been wasted in the jungles, it has, or may have, to pass through the hands of two or three sets of dealers, and when it has been adulterated with dirt, loaded with expense, and the first cost become doubled, it is then shipped to Liverpool to be sold in competition with the clean cotton of the United States.

We have already indicated the propriety and necessity

of immediate changes in India, more particularly with reference to the security of tenure to be given to the land, the provision of irrigation of improved means of conveyance, and of other essential facilities which rightfully devolve upon landlords.

How shall we approach this subject? In dealing with ordinary practical questions we are accustomed to have reference to the results of experience, and the nearest case of example will be found in the United States of America, the country with which we have been engaged in the friendly strife of cultivating cotton, and have so ingloriously been defeated.

Those who had to do with the Institutions of the United States in regard to the future wants and prosperity of their fellow citizens in that country, had before them the world's experience of conducting a government, and amongst the rest they could not fail to have reference to the policy which this country had adopted with relation to India.

Did they follow our example, or, rather, did they not shun it?

In one respect they were unable to follow it, and, therefore, the example was needless. They had not, as we had in India, a cultivated country and an abundant population, whose resources and whose industry they could exhaust.

Their starting point was upon the hunting ground of the Red Indian, whom they had to expel, and upon that they have founded the most prosperous empire in the world. They knew they had a source of wealth in the development of a fertile soil, provided they could attract labour and capital into the country by emigration.

And how did they go about the promotion of their object?

The various States struck out their territorial boundaries, framed their own laws for regulating the construction and the upholding of roads, bridges, &c., not forgetting the education of their youth, and they made large appropriations of lands to cover the expenses. They took an enlarged view in every sense. They sold the cultivator his land out and out, and did not leave him to toil upon the cotton lands pestered with tax collectors and unprovided with means of conveyance. When the proprietors of steam ships sought the navigation of their rivers, they did not set aside the application as the government of India did that of Mr. Bourne, allowing him to wait nine years, till mutiny arose, before they would give him an answer; on the contrary, they acceded at once, and may now proudly boast that their mighty rivers are crowded with steamers, probably exceeding in number and in magnitude all the river steamers of Europe, conveying their productions and their merchandise in untold extent for shipment and distribution to all parts of the world.

The cost of conveyance of a bale of 400 to 500 lbs. of cotton a distance of 1,000 miles upon the Mississippi river has been as low as one dollar, and ranges from that sum to 1½ dollar, or 6s. 3d., and it is therefore in commodious and cheap conveyance, and not in the cost of growth, that the present advantage of America over India as a cotton growing country is to be accounted for.

The general prosperity of the United States may be determined by the fact, that the demand for public lands has been large and constantly increasing; that the receipts for land sales and the import dues at the custom-house have supplied the revenues of the government, without the aid of a single tax-collector; and such has been the prosperous issue of their care and forethought for the cultivator, that from one crop alone, that of cotton, the cultivators now raise a larger pecuniary amount, from year to year, than all the Government revenues of India, opium included. It may be alleged that the two cases are very different, and so they are, the disadvantage being on the side of America, in having to commence upon a country without people. It may also be supposed, that land sales in India cannot be made as in

America, because the people are poor. The same supposition existed with regard to Ireland. When the potato famine had desolated that country, and the Encumbered Estates Act was passed, to enable the capitalists of England, it was supposed, to buy up Ireland, it was, at that time, little expected that capitalists would be found in Ireland, as it has since proved that there were, who would become purchasers of the principal part of the land offered for sale. This may, or may not, be the case in India—the opportunity has not been afforded. We know that, over and over again, applications have been made by capitalists for permission to invest their money in the fee-simple of the soil, and that these applications have been uniformly resisted. We know that there are many wealthy natives; that a large portion of the Indian debt has been loaned by these people; that many millions a-year of payments in silver are sent from this country to India, amounting in 27 years to £150,000,000 sterling, and it is believed that a large portion of this coin is remaining in the country. These afford indications of a course which may deserve to be considered.

There is a duty of a very serious and solemn character devolving upon this country, in relation to the future of India; and there is also a duty, no less weighty, in regard to our own country, and to the difficulties which are already indicated as menacing the commerce of the kingdom.

In approaching that duty, let us thoughtfully consider the responsibility attaching to the exalted position we have assumed, in having possessed ourselves of India, and in having dispossessed the people of their native rulers.

CONCLUSION.

As an existing race, we make boast of our historic origin—we trace our proceedings through eventful ages, through periods of darkness and gloom mingled with alternate gleams of light and progress, apparently insensible that what we call antiquity is comparatively of yesterday; and that in regard to passing time, the earliest Britons stand only amongst those links of the chain which connects the past with the present. There is a charm of vitality in these reminiscences which the poet Richards has embodied in the following lines, illustrative of the character and power of the Ancient Britons, which we, their descendants appear to have inherited:—

"Rude as the wilds around his sylvan home,
In savage grandeur, see the Briton roam!
Bare were his limbs, and strung with toil and cold,
By untamed nature cast in giant mould;

*
Such was the race who drank the light of day,
When lost in western waves Britannia lay.

*
In these rough days of Albion, 'midst her snows,
Hardy and bold, immortal Freedom rose.
Now walks the land, with olive chaplets crowned,
Exalting worth and beaming safety round;
With secret joy, and conscious pride, admires
The patriot spirit which herself inspires;
Sees barren wastes with unknown fruitage bloom;
Sees labour bending patient o'er the loom;
Sees science rove through academic bowers,
And peopled cities lift their spiry towers—
Trade swells her sails, wherever ocean rolls,
Glows at the line, and freezes at the poles.

*
That mind which hid in savage breasts of yore,
Lay, like Golconda's gems, a useless ore,
Now greatly dares sublimest aims to scan—
Enriches science and ennobles man;
Unveils the semblance which its God bestowed,
And draws more near the fount from whence it flowed."

In the above picture of the poet our country has been truthfully described, and at the present hour the same spirit is inspiring us to further efforts, and leading us to vaunt ourselves upon the rapidity and extent of recent progress, pointing to the cultivation of arts, science, literature, and philosophy, and to our having attained a manufacturing and mercantile pre-eminence, and a command of wealth and power undreamt-of by our forefathers,

Let us not forget how suddenly and unexpectedly we have become possessed of the ingenuity which has led the way to all our modern progress, and that, along with the possession of property and of intelligence, there are also duties to be observed as well as rights to be enjoyed. These discoveries are rapid advances, are chiefly of the last half-century.

Shall we still advance?

It is evident that the permanence of our national power must mainly depend upon the continuance of that manufacturing supremacy which we now hold, but which has been shown to be threatened with danger.

It must be well known that our manufacturing industry is not sustained upon British products alone,—that its first element, raw material in every branch is chiefly supplied from abroad. The returns have shown that that manufacture which, more than any other, contributes to our national commerce is cotton; an article which is indispensable, to sustain the existence of that large fabric of property and industry which is essentially its own, and almost in an equal degree to that its kindred manufacture—wool.

This alarming necessity for raw cotton, we know that our fellow subjects in India would be but too happy to supply, if facilities were afforded them to do it. Those who are best acquainted with the resources of India, affirm their belief that if we would now proceed to establish a proper tenure for land, and provide the needful arrangements for the complete and profitable occupation of the soil by means of roads, railways, canal and river navigation, with irrigation for the crops, all of which they surely ought to possess, the people of India would become a flourishing people, gratefully attached to their rulers, and would become far larger consumers of our manufactures; and thus the prosperity of both countries would be secured.

We must ever bear in mind that it is not for India alone that we are concerned, but for the consolidation of our commerce, and the advancement and security of that national greatness which we hold in our possession. Hence, efforts require to be made to an extent correspondent with the magnitude of the evils impending over us and requiring to be averted. In short, an obligation of the most sacred character demands that we should at length do justice to that vast dependency. Measuring our duty by no higher standard than that of material interest, it is but too obvious that, should we continue to withhold from India that which is rightfully her due, our own industry will stagnate, our commerce decline, and the end of so disastrous a policy will be our own impoverishment, humiliation, and national dishonour. On the other hand, should we adopt the ennobling principles of justice, and in that spirit administer the functions of our rule, we might then look forward with confidence to the existence of a prosperous empire, and to the grateful emotions of a contented people, whose industry we had released from thralldom, and whose laws we had founded in equity and placed within the reach of all.

DISCUSSION.

Colonel SYKES, M.P., F.R.S., lamented the ignorance which prevailed in this country relative to India. If people would but go to India and see its state for themselves, he was persuaded the fictions which were put before them, from time to time, would produce no impression. He had marked down at least a dozen passages in Mr. Ashworth's paper which he could refute by facts; but the lateness of the hour would only permit him to take up one or two of them, in order to show how utterly unfounded were the assertions that had been made. Mr. Ashworth had stated that the fee-simple of land was not to be obtained by purchase in India. What was meant by fee-simple? Was there in existence in the present day in any part of the world a fee-simple of

land that did not pay some tax? Had not land in this country always been subject to a land-tax, which, in the present day, even amounted to £1,200,000? There was no land in this or in any other civilised country exempt from the payment of rates, county roads, &c.? Land might be obtained in India if it were made worth the while of the owner to sell it. He would read to the meeting some of the Government rules under which land could be held by those who could persuade the owners to sell it—not in fee-simple, as Mr. Ashworth had called it, that was, free from taxation, a state of things which had no real existence—but under the terms which he would read to them:—

"Throughout the greater part of India, land is already private property, and cannot therefore be disposed of at the pleasure of the Government. Europeans may, however, under Act IV., of 1837, 'acquire and hold in perpetuity, or for any term of years, property in land, or in any emoluments issuing out of land,' in any part of British India. It is only in districts like Gorakhpore and the Deyrah Doon, where large tracts of waste land exist to which no individuals have any claim, that the Government have it in their power to make over the property in the land to applicant-desirous of cultivating it. The terms adopted for grants in these districts were, a lease for forty years, under which one-fourth of the land was to be rent free, for the whole term and the remainder for three years, after which the twentieth part of the rent assigned was to be paid, rising annually in twentieths, until at the end of the twenty-third year, the maximum rent of twelve annas (1s. 6d.) per acre would become due, and the land, subject to that payment, would be the *absolute property of the grantee*. Conditions were inserted in the lease to provide for the land being brought into cultivation according to stipulated annual proportions, on failure in which the portion of the grant found to be uncultivated, reverted to Government. In the districts of Kumaon and Gurwhal, there are immense tracts of land suitable for tea cultivation, which are at the disposal of Government. These lands will be granted to persons possessing sufficient means and capital in lots of from 200 to 2,000 acres, one-fourth to be free from assessment in perpetuity, and the remainder for four years, after which a rent of one anna (1½d.) per acre will be charged, rising annually by the same sum, until in the twentieth year, when the maximum rate of one rupee (2s.) per acre will be reached, after which the *proprietary right in the grant vests in the grantee, who, in whatever manner he may cultivate the land, will never be called on to pay more than the average rate on grain crop lands in the same locality*. Provisions are to be inserted in the lease to secure the land being cultivated with tea plants, which are supplied gratuitously by Government to the extent of their means."

For four years no rent at all was paid, and it was only at the end of the 20th year that the maximum rent became due, one-fourth being free of rent for ever, and the rest being at from 1s. 6d. to 2s. per acre for land which produced sugar, indigo, and oil seed worth £20 per acre; and, moreover, the land, subject only to that payment, would be the absolute property of the grantee. Therefore, notwithstanding the assertion of Mr. Ashworth to the contrary, there were means of obtaining property in land in India. In the district of Kumaon and Gurwhal, there were, as was stated in the rules which he had read, immense tracts of land suitable for, the cultivation of tea, and this was being carried on with satisfactory results, producing teas which rivalled, if they did not excel, those of China itself. In fact, the people there paid more for that tea than was paid for such an article in this country. The conditions inserted to provide for the proper cultivation of the land could hardly be complained of. The official rules which he had quoted were now in existence, and had been made as far back as the year 1837, and these rules applied to the whole of India—wherever there was waste land. About one-third of the land in India was waste. The great outcry was that India had not sent cotton for the home market—that it did not produce a regular and reliable supply of that article. Did the cotton manufacturers expect that people were to cultivate cotton in India and lay it up in store to meet the demand of the Manchester manufacturers just at the time when Ameri-

can cotton chanced to rule a farthing a pound dearer? Was that the expectation of the intelligent classes in this country? Was it rational to suppose that it could be done, and was it right to call upon any class of people to do it? Ought the government of India to interfere with any person's estate so as to compel him to cultivate any particular product in preference to any other? Had they any more right to do that in India than the Government of this country would have had to call upon the landed proprietors of England, to cultivate potatoes for the benefit of the Irish during the late famine? He contended they had no more right to interfere in the one case than in the other. Now, let them see what had been done in India, as regarded the cultivation and export of cotton in particular. The Government of India, for the last 30 years, had been engaged in prosecuting experiments with the cotton-plant. It had tried every variety of soil, and had had seeds brought from the United States, from Pernambuco, Egypt, and other parts of Africa. As much as £100,000 had been expended by the Government in these experiments, without the slightest advantage whatever to itself. It had been found that those cotton seeds except at Dharwar would not succeed in India; the indigenous plant was that which would flourish best there. Nevertheless, the stimulus applied by these cotton experiments had produced some striking results with regard to that article. The export of cotton from India to England, in the years 1834-5, amounted to 38 million lbs. In the years 1855-6, the latest date to which the customs returns were made up, the quantity exported was about 170,000,000 lbs. Thus the increase in the export of cotton from India to England in 20 years was more than 340 per cent. Did that show a want of stimulus or a lack of disposition on the part of the people of India to cultivate cotton when it was worth their while to do it; but at the same time, was it reasonable to expect that they should cultivate cotton when they could get a far larger return from the cultivation of sugar, indigo, or oil seeds? Then, again, with reference to the export of cotton from India to all parts of the world. The quantity exported in the years 1834-5 to all parts of the world was 98,000,000 lbs., and in 1855-6 it was 237,000,000 lbs., or an increase of 140 per cent. in the export of cotton to all parts of the world, whilst the exports to England alone increased in that period 340 per cent. Thus far as regarded the article of cotton. Who-e fault was it if the manufacturers in England did not get the quantity of cotton that they wanted? He supposed people did not usually sit down and expect the good things they wished for to be dropped into their laps. If they wanted them they must go after them, or employ others to do so for them. Why had not the cotton manufacturers done what he had been for the last 20 years endeavouring, in print and verbally, to persuade them to do? Why had they not gone themselves to India, or sent their agents? Why did they not do as the indigo manufacturers had done? Those gentlemen went to Bengal, and either acquired landed estates, or made arrangements with the owners of such for the cultivation of indigo, which they manufactured in their own establishments in India and exported to this country. Others had done the same to obtain sugar and oil seeds. Why did they call upon government to do that which they ought to do for themselves? If they had done what he advised, they would probably have been able to obtain any quantity of cotton they required. There was a fertile soil, a fine climate, a willing people, low wages, and they had nothing to do but to make such arrangements as had been made by the indigo manufacturers. This had been done in Madras and Candesh, and no doubt it was the same in other parts, almost the whole of the factories being owned by Europeans. Therefore, he contended, the fault was with the cotton manufacturers of England and not with the government of India. To go into the condition of the people of India by way of reply to the assertions contained in the paper would occupy more time than the meeting would be in-

clined to accord him, but he would only touch on an important point. He had before him the whole of the facts relating to the condition of the labouring population in the north-west provinces, including the Bombay Presidency, comparing it with that of the working classes in this country in relation to wages. In India the wages would be about 6s. per month, whilst in this country he would take them at 10s. per week. The result with reference to taxation was that whilst the pressure in India was 6·94, in England it was 8·04. Those were facts—not suppositions—which anybody could determine for himself. He could enter into statements with reference to the condition of the farming population in India and the other subjects adverted to by Mr. Ashworth, but it would occupy too much time to do so on the present occasion. In the North Western provinces, taking the total area, the average rent of land at the present moment was 1s. 7½d. per acre for land capable of producing sugar, indigo, oil-seeds, and also cotton. The rent for the cultivated land in those provinces did not exceed 2s. 4½d. per acre, and the highest assessment was 3s. 0½d. to 4s. per acre. It was objected that there were no roads to convey the produce to the seaports for exportation. How then was it that 378 000 000 lbs. of cotton had found their way to the coast for shipment if there were no roads? There must have been a profit to the owners, or they would not have sent the cotton to the coast. The whole country was a sound, hard, dry road for eight months of the year, but during the monsoons, of course there could be no roads at all. Then as to irrigation; during the last five years the Government had expended two and a half millions sterling annually on irrigation, roads, and public works in India, according to a return to the House of Commons. It was his desire that the facts regarding India should be looked into, and he advised the gentlemen who were continually calling upon Hercules to help them in procuring cotton, to put their own shoulders to the wheel, and the cotton waggon would go along at a railway pace.*

* In further elucidation of this subject, the following extract from a notice in the *Times* of a work by the late Dr. J. Forbes Royle, F.R.S., entitled "Review of the Measures which have been adopted in India for the Improved Culture of Cotton," is inserted at the request of Col. Sykes:—"Whatever, therefore, may be the result of judicious culture in special localities, the prospects of obtaining a large supply of American cotton of Indian growth are very doubtful. But it is certain that native Indian cotton might be obtained of a quality and at a price to compete with a large proportion of the American cotton. Though short in staple, and not easily spun by machines suited to American cotton, the natives contrive to spin it into the finest yarns. In strength, durability, and other good qualities it is well adapted for at least one-half of the manufactures in this country—that is, for all yarns under No. 20. Indian cotton of this quality could always be sold with profit in Liverpool at 3½d. a pound. The cost of production and of carriage is not the hindrance to a large and regular supply. But the uncertainty of price in the English market, determined by that of American cotton, prevents the steady increase of Indian culture and commerce. When the difference between the two cottons is ½d. to 1d. a pound the spinners of No. 20 yarn will give the larger sum for American cotton, on account of the waste from the inferior condition of the Indian cotton. It is to the improvement of the quality and state of the Indian cotton that attention ought to be first of all directed. Since it can now be sold for a profit in Liverpool at 3½d. a pound, there is a wide margin for improving the quality so as to secure a demand in the market. It must be admitted that little can be done at present towards improving culture. This can only be effected by the slow influence of European or American overseers superintending the ryots, and by the stimulus of a higher price offered for a better article. But there are other causes which depress the value of Indian cotton in the market. It is carelessly collected, carelessly cleaned, carelessly housed, and carelessly packed. The middlemen who buy it from the ryots fraudulently adulterate it to such a degree that one-fourth of the fair price is the usual deduction of a purchaser for estimated impurities. The ryots,

Sir ERSKINE PERRY, M.P., said, his hon. and gallant friend had come to the rescue of the East India Company at an untimely moment. It had been said by the present Chancellor of the Exchequer, not long since, that the East India Directors, of whom the gallant Colonel was one, were corpses, but the warmth just shown by his hon. and gallant friend went far to contradict that assertion. Colonel Sykes had, on this occasion, pursued the course too often adopted by the advocates of the East Indian government in charging those who disputed their policy with gross ignorance and fallacies of every description. He had also distracted the attention of the meeting from the real object before them. They were not there to try the East India Company, or to go back into the history of the policy which, for a century past, they had pursued. The question was, could they obtain any further supplies of cotton from India or not? He would tender his best thanks to the gentleman who had read this paper, and also to the men of Manchester and the North, who had kept this subject so steadily before the public. They were considering in another place what the future form of Government in India was to be, and all our best statesmen were applying their attention to that great subject; but he thought none of the details of such a measure were to be compared in importance with that which had been brought before them in the paper of that evening; for it was one on which the future prosperity of this country, and also of India, mainly depended; it might be that the men of Manchester were self-interested in this question—but it belonged to the development of commerce, that its true interests coincided with the progress and happiness of mankind at large. The gallant Colonel, with much warmth, had challenged contradiction of the facts he had brought forward, and he (Sir Erskine Perry) accepted the challenge. Colonel Sykes had made bold assertions before a meeting in which there were persons present who were as well acquainted with India as himself, and perhaps better. He would take the most important of his statements, and prove it to be entirely incorrect. Colonel Sykes read some rules to prove that the acquisition of the proprietary-right in land in India was open to all, Europeans as well as natives, and therefore that the outcry against the short-sighted policy of the Court of Directors was mere declamation. Upon that he entirely joined issue with him. Throughout India generally, no capitalist could invest money in land, for the simple reason that land had no saleable value. The rack-rent assessment of Government left no surplus arising out of the soil beyond the means of subsistence. The gallant Colonel had referred to the Englishmen who had grants of land in the neighbourhood of Goruckpore, but he (Sir Erskine Perry) had been there, and had rarely seen such desolation in any part of India. In fact, it was notorious that most of the grantees were insolvent. What did that say then for the terms which the great landlord—the East India Company—offered to its tenants? But, instead of looking to remote jungle districts, such as Kumaon and Goruckpore, to which the gallant Colonel had referred them, he (Sir Erskine Perry) would turn to the cotton-growing districts of India, and show them what was the actual produce of the land, and the amount of rent paid for that land. In these districts an acre of good black soil would produce only 60lbs. of clean cotton, and the value of it, including the seed that might remain for sale, was only 11s. What was the rent or assessment of the Government upon that? It was very nearly 4s.—it was 3s. 8½d., and to this must be added the cost of cultivation.

naturally indolent, prefer the tolerably certain return for inferior and dirty cotton to the trouble and expense involved in having a cleaner cotton ready for the agents when they come round to purchase."

Col. SYKES said the assessment was 3s. 9d., but the value of the produce was greater than had been stated.

Sir ERSKINE PERRY said he took the value of the produce from the testimony of Mr. Shaw, an intelligent civilian in the Company's service, who, for many years superintended the cotton cultivation in the South Mahratta country, and he had stated that the produce of an acre of land was 60 lbs. of clean cotton. There was also, the report of Dr. Wight, which had just been laid before Parliament, and this gave precisely the same results. That being the produce of the land, the assessment being 3s. 8½d., and the cost of production from 4s. to 5s., all that was left to the cultivator as profit was about 2s. 10d. per acre per annum. He would ask whether, with such an assessment upon the land, any capitalist would invest in it? The real fact was, that the land had not a saleable value. The next argument used by Col. Sykes was that cotton was not a profitable article to cultivate, and that as the land could be better employed in other productions, it was no part of the duty of the government to dictate to the owners what crops they should grow. That was a point never contended for by anyone. Free trade in land and production was what he advocated. The other argument, which had been frequently employed in the House of Commons—but a more absurd one was never put forth—was, that if the manufacturers of Manchester wanted cotton, they should go to India and produce it. The manufacturers were to turn cotton farmers—in fact, to convert their spindles into ploughs. Was not that argument upon the face of it absurd? Allusion had been made to the indigo planters. But they, in fact, were manufacturers. The plant was grown by the cultivator, and the blue was subsequently manufactured by the Europeans.

Col. SYKES—That was done with cotton by the Europeans in Candeish and Guzerat.

Sir ERSKINE PERRY did not believe that, at the present time, there was a single European cultivator of the soil in Candeish. He had travelled through that district from beginning to end. A finer cotton country could not be found. It was covered with the remains of old irrigation works, but was now a perfect jungle, and quite neglected. He would make, however, a concession. He did not believe British capital would be immediately effectual in producing more cotton from the soil. Cotton was not like indigo in Bengal, or coffee in Ceylon—the direct production of skill and of capital applied to the land. It was a produce requiring simple agricultural labour, and ordinarily fertile soil. It was not therefore likely that capitalists would invest in land which would yield them a profit of less than 3s. per acre. In this country ordinary wheat land in the hands of a capitalist produced from 4 to 5 quarters of corn per acre, at 60s. per quarter. No British capitalist therefore would go half round the world to cultivate land at a profit of 3s. per acre. It might be said that capital employed in irrigation would increase the crops. That was true. But if they applied capital and skill in this way, the capitalist—whether European or native—would raise more valuable products than cotton. They would grow oil-seeds, tobacco, and sugar; and if a Manchester house sent out agents to India to grow cotton, and those agents reported that they could make 30 per cent. by growing sugar, in the place of 5 per cent. by growing cotton, their employers would, of course, say, "grow the more productive crop." He, therefore, did not believe that British capital and skill would increase the immediate production of cotton in India; but if wise and generous principles of government were applied to that country; if waste and fertile lands were sold in perpetuity, without an onerous land assessment, which destroyed all saleable value, then he thought British capitalists would invest in it, and raise the valuable products he had spoken of. But the same laws that would enable the European capitalist to do that, would operate as an incentive also on the native capitalist,

and profits which did not attract a European would be amply sufficient for a native. The possession of land was so highly regarded in England, that a lower amount of interest was accepted than in any other kinds of investment, and the love of land was just as deeply implanted in the breasts of the natives of India, who would invest in it if sold in fee simple—a thing not now known in that country, but which he hoped would shortly be introduced there. They would then see a great increase in the supply of cotton, grown by native capitalists and worked by native cultivators; and, under those just and equal laws which he trusted would be accorded to all our fellow subjects, of whatever colour or creed, those great and useful results which Mr. Ashworth had touched upon would be brought about, upon which the prosperity of this country and of India so mainly depended.

Dr. WATTS could not withhold his humble testimony to the extreme value of the paper read by Mr. Ashworth. The point which he wished more particularly to notice, was one which had not been touched upon by Mr. Ashworth. The great stride in the cotton manufactures took place upon the removal of the duty upon cotton. Since the removal of that duty the increase in the trade of cotton-printing had been from 500 to 600 per cent. Dr. Watts proceeded to remark that it was somewhat anomalous that, whilst the tax had been removed from cotton, yet that the refuse of that material, when made up into paper, was subject to a very heavy excise duty. It was remarkable that for some of the Continental markets it was requisite to wind the sewing-cotton upon millboard, so that whilst the cotton itself was free from duty, the material on which it was wound was taxed.

Mr. J. B. SMITH, M.P., said he had listened with some surprise to the speech of Col. Sykes, as coming from one of the governors of India, and, therefore, possessing some interest and importance. The House of Commons had recently decided that the government of the East India Company should terminate. He had given his vote in favour of bringing in this bill and the speech he had heard that evening quite confirmed him in the conviction that he had given a sound vote on that subject. The East India Company had, for more than a century, had possession of a country which, from its earliest antiquity, had been celebrated for its riches. The riches of India were proverbial. The late Sir Charles Napier, in his own strong language, had said of India that, "What the Koh-i-noor was among diamonds, India was among nations." It possessed all the climates of the world, and a capability of yielding every kind of produce. But, notwithstanding we were possessed of this extraordinarily rich country, we exported more of our manufactures to a few thousands in Australia, than to the whole 200,000,000 of the population of India. This fact alone ought to be decisive with regard to the Government of that country. The gallant colonel had referred to the extraordinary increase in the exports, and assumed some credit to the Indian Government for that increase; but this had taken place in spite of the Government. From the very commencement the Government had endeavoured to prevent the settlement of Europeans in India, and, up to the year 1833, it was a misdemeanour for an Englishman to be found on the British territories of India. He would ask, what would have been the difference at this day if Englishmen had had the same right of proceeding to India and holding land there, that they had in our other British colonies? Instead of having only between 300 and 400 British subjects settled in the interior of India, there would probably have been 400,000 to 500,000 Englishmen settled there. Would the present state of things in India have existed if such had been the case? We had taught the Indian people nothing but the use of arms, and those they had turned against us. Colonel Sykes had told them an extraordinary story about the tenure of land in India. He (Mr. Smith) had been a member of the Committee of the House of Commons appointed to inquire into the growth of cotton in India.

Evidence was there given, showing that the mode of levying the assessments was, that when the cotton was ready to be picked, a surveyor went round and assessed the amount to be paid by the owner. If it was a good crop he had a proportionately large sum to pay; if a bad crop the amount was less, and the poor grower was left with just enough to keep body and soul together till the next crop. The committee reported that in the presidency of Bombay the ryots were in the most abject condition. Lord Harris then stated that in Madras there were 5,000,000 farmers, and that not ten of that number owned £1,000. With regard to the condition of the people in Bengal, Col. Sykes had spoken of this state of things as having existed a long time ago. He would read to them a short extract from the *Friend of India*, in 1851. Mr. Smith read an extract from the paper quoted, which stated that the general food of the farmers was nothing more than boiled rice, with sometimes a little salt, and numbers could not procure that, but, as a substitute for salt, ate the dried leaves of the plantain. Others could afford a few drops of oil with their rice, and he who possessed a dwelling with mud walls was considered a wealthy man.

Col. SYKES—Those were under the Zemindars.

Mr. SMITH would take the whole Presidency of Madras, which was under the government of the Company. The account from which he quoted went on to state that, pressed down as the ryots were by the load of taxation, they were too poor to purchase the Company's salt as an accompaniment to their miserable food of boiled rice or vegetables—the latter frequently consisting of the wild herbs of the country. They were unable to supply themselves with clothes beyond a piece of coarse cotton fabric, worth 2s., once in twelve months. This state of things was the grand secret of the smallness of our exports to India. The people had not the means of purchasing our productions; and Sir Thomas Munro, one of the highest authorities on Indian affairs, had said that the only reason why we did not export a large amount of our productions to India was because the people were unable to purchase them; and he added that if the land-tax were altered, roads made, and irrigation carried out, the condition of the people would be improved, and the amount of our manufactures consumed would be surprising. Now, as to cotton. Mr. Ashworth had stated a fact which might not have struck them at the time—namely, that a bale of cotton was brought down the Mississippi, a distance of 1,000 miles, at the expense of about one-eighth of a penny per lb. That was about three parts out of a hundred of its value. The cotton in India had to be transported some 200 or 400 miles on the backs of bullocks, in a country where there were no roads, and it occupied 60 or 70 days to bring the produce to the markets, and sometimes as much as three months, if overtaken by the rains. The consequence was the expense, instead of being three parts out of the hundred, was fifty parts out of the hundred; and, therefore, we could never have a trade with India in cotton, except the price of cotton was so high as to repay the enormous expense of the carriage. If the price of cotton fell one half—say from 6d. to 3d. per lb. the American cotton grower still paid one-eighth of a penny per lb. expense, whilst the Indian grower nothing would be left. The consequence was he ceased to cultivate, and did not return to the cultivation till the price rose so as to enable him to pay this high charge for carriage. Some time since he (Mr. Smith) had read a paper* before the Society, pointing out the obstructions that existed to the production of cotton in India. Col. Sykes had said why did not the Manchester people go out and grow it for themselves? Englishmen would not go into a country where there were no roads and no laws to protect them. Mr. Mangles, the present Chairman of the East India Company, in his evidence before the Cotton Committee,

acknowledged that it was the duty of the Government to make roads and promote irrigation, and likewise to afford protection to life and property—none of which they had done; and it was vain to call upon Englishmen to waste their capital in India until they had those facilities. The gallant Colonel had talked about indigo, but there was this difference between indigo and cotton—that cotton was a raw article, worth from 3d. to 6d. per lb.—the cost of bringing it to market being half its value—whilst indigo was a manufactured article which sold at from half-a-crown to six shillings per lb. and it was very little consequence whether the carriage was three half-pence or 6d. per lb. He believed cotton could be grown cheaper in India than in any other country, but this could not be done without irrigation and roads to bring it to the market. Let them look at the Presidency of Madras: in the whole of that province not a quarter of the land was cultivated; three-fourths was lying idle, and yet it was full of population. They had heard of the proposition to send coolies to the West India Islands for the purposes of labour. Why not keep them to cultivate the richest land in the world at home? The reason was that the land wanted irrigation. In the eastern parts of Madras there were remains of works of irrigation, which, reckoning the difference of money in this country and in India, were supposed to have cost as much as the whole of the railways in England. Therein lay the secret of the riches of India which they had heard. It was the irrigation which made the soil productive. It was the same with Nineveh, Babylon, and Ancient Egypt, once teeming with population and wealth—but now wastes; and from the same causes the land of India remained a waste for want of irrigation. Until the East India Company did their duty in the way of works of irrigation and roads he had little hopes of improvement in the condition of the people of India. But he had this hope when the government passed out of the hands of its present rulers, as he hoped it would, and if placed upon the same footing as our other English colonies, India would be equally prosperous with them. There was a colony near to India—the little colony of Ceylon. Would they credit the fact that there were more roads in that little island than in all India. That was a colony under British government, and here it had not neglected its duty.

Mr. J. A. ROSE alluded, in warm terms, to the foundation of the British Indian empire by the middle ranks; and, seeing the pitch of eminence to which, he said, that empire had been raised, he, for one, would be sorry to see the government wrested from the hands of the middle classes and transferred to those of the aristocracy, who, he considered, had already a sufficient share in the government of the country. Speaking of our relations with the United States in connection with the supply of cotton, Mr. Rose remarked that those in America most anxious for peace were the cotton growers of the Southern States, and contended that if we made ourselves independent of America for our supply of cotton, the great incentive to the maintenance of peace would be destroyed.

Mr. THEOBALD complained of a want of candour on the part of Col. Sykes, in the course he had adopted in citing the official rules, which he had applied wrongfully, as he (Mr. Theobald) submitted, to the tenure of land, as they were accustomed to regard it. The act of 1837, he contended, applied to the removal from foreigners, whether European or otherwise, of certain disabilities which previously existed, and not to the tenure of land. The great question to be considered was, whether lands in India could be acquired on such terms as would make it profitable for Europeans to hold them. The provinces from which they must practically look for the supplies of cotton were those of Madras and Bombay, and he submitted that those were the districts with which Col. Sykes ought to have dealt in disputing the propositions of Mr. Ashworth. The rules which

* See *Journal*, Vol. V., p. 374.

Col. Sykes had quoted applied to Upper India, 700 or 800 miles from the nearest ports from which cotton could be shipped for Europe, and to a part of India from which there was a very remote probability of even getting any cotton at all; but Col. Sykes had forbore to tell them what was the state of things in those parts from which they must look for the sole supplies of that commodity. It had been asserted that leases for a limited term could be obtained on terms favourable to those who took them. What Europeans wanted was a perpetual tenure, and he understood Col. Sykes to quote those rules as showing that they could obtain land in perpetuity. He (Mr. Theobald) said, as respected the proofs given, Col. Sykes had failed to show that such was the case. The sense in which he had applied the act of 1837 was not a correct one. What was the character of the tenure in Bombay? The servant of the collector, at a salary of 8s. per month, ascertained the state of the crops, and the value of the land, and made his assessment from year to year accordingly; and they knew from the report of the Madras Torture Commissioners what the nature of the collection was in that presidency. There were numerous modes of torture employed in order to collect the revenues. Would torture be resorted to if the payment were not of the most extortionate and oppressive character? And they knew, from the general description given, that the population was reduced to a state of extreme poverty; and, whatever gentlemen connected with the East Indian Government might say,—this could be traced to the amount that was drawn from the people in the shape of land revenue. They not only wanted cotton, but cotton of a quality that could be used by the Manchester manufacturers. How could they hope for improvement in the cultivation with the population in the condition that had been so truthfully described by preceding speakers? There were other causes which produced this state of things in India, foremost amongst which was the want of a just administration of the law, and of due protection to those who did enter the country; and he saw no prospect of improvement in those particulars so long as the officials of the Government were protected in their mal-practices by the Court of Directors at home.

Colonel SYKES begged to state, in reply to Mr. Theobald, that the rules he had quoted with reference to land-tenure, applied equally to the whole of India, from Cape Comorin to the Himalaya mountains.

Mr. OTWAY would allude to the dictum of the gallant colonel, as to the general ignorance in this country upon Indian matters, if it were only to offer him the consolation that the English people were in rapid course of enlightenment on that subject. He called upon the present meeting to accept, with the least possible confidence, the statement with reference to Indian matters that fell from a director of the East India Company, for, in his opinion, these gentlemen were not very accurate in their figures, and made general assertions which had frequently been proved wrong. With regard to the assessment, as far as his own knowledge went, he believed it was taken upon the value of the crops from year to year. Colonel Sykes had stated that, during the last five years, two and a-half millions had been annually expended by the Government in public works in India. This was not a fair view of the case. He (Mr. Otway) ventured to say that not half a million had been expended upon really useful public works.

Col. SYKES said this expenditure was shown by returns to the House of Commons.

Mr. OTWAY said it was true that immense sums had been expended for barracks and military works, but were these works of a character to benefit India, or calculated to develop the resources of the country. Mr. Ashworth had pointed out the defects in the present Indian administration; and he (Mr. Otway) could not congratulate the gallant colonel on the advocacy of the gentleman

(Mr. Rose) who had boasted of the conquest of the empire from Burmah to Scinde. There was much sad truth in that statement, intended as complimentary to the East India Company. It was too true that they had turned their attention to works of aggression; to building up an empire for purposes not connected with the honour and true glory of the country. They had neglected the development of its industrial resources, and that wealth which made a people truly rich and happy. Let them desist from these disastrous aggressions, and let them turn their attention, above all things, to the cultivation of cotton, and they would then confer benefits, such as the wildest dreamer never conceived, both upon India and this country.

Dr. RIDDELL wished to make a few observations, with regard to the capabilities of growing cotton in India, so as successfully to compete with the American agriculturist in the English market; for the wants of the manufacturers were such that, if from any causes at present unforeseen, the supply from America should fail, or be insufficient, a greater calamity to the nation could hardly be contemplated. He thought that it was to India we must look with the greatest confidence for meeting any deficiency, and for a continued supply of this product, whether it were from acclimatized, foreign, or indigenous seed, samples of which were lying on the table, which might be considered fair specimens of what had been grown in the Deccan without the assistance of irrigation—a point, he thought, of the utmost importance, for he felt certain that, if it was ever intended to raise this article to any extent on our Indian soil, we must not look with too much confidence to being able to bring irrigation to the aid of its increase and improvement, knowing, as he did, from the length of his sojourn in that country, that, where irrigation was at hand, either from the proximity to rivers, streams, or tanks, it would be found that a more valuable product could be raised, in nine cases out of ten, than the one in question. They had been told by Col. Sykes that the American cotton could only be grown in the Dharwar districts. He (Dr. Riddell) had placed upon the table cotton grown by himself in the vicinity of Hyderabad, in the Deccan, and if those samples were placed before the best judges in Manchester, he felt confident they would be pronounced nearly as good as any that could be sent from America. If they could grow clean cotton in India like that before them, why should they go to America for it. He thought, if the resources of India were attended to, cotton like that now exhibited might be produced very extensively, and the wants of the Manchester people met. He had also placed on the table some samples of indigenous cotton, which, in Manchester, was generally declared to be 25 per cent less in value than American cotton, because it was dirty, adulterated, and unfit for immediate use. This often arose from such causes as the following: When the cotton was collected and brought to the villages, it was placed in heaps, and wood ashes were strewn in circles over it, to prevent persons stealing it without its being discovered. Other kinds of adulteration occurred, sometimes accidentally, but oftener intentionally. Besides this, he had often observed, that when the cotton was ripe for picking, the cultivator could not do so, because the assessor or collector was not forthcoming, perhaps for several days, to make his valuation. The cotton thus became loose, fell from the pods to the ground, and had to be picked up from the dirt which adhered to it, and contributed to the deterioration of the commodity for the market. It was generally picked from the bush by women and children, who took in their hands the external covering of the dry pod, which became a mass of dirt, and necessarily adhered to the wool, and was mixed with it. These were only a few of the causes from which the complaints against the indigenous cotton had arisen.

The CHAIRMAN said, at the late hour to which the proceedings had extended, he should probably best con-

sult the wishes of the meeting by not entering into the question in the way he could otherwise have wished to have done. Having passed a considerable portion of his life in India, and having taken a deep interest in its affairs, he had hoped to be able to take part in this discussion, but he had no doubt he should best consult their wishes by passing at once to the pleasing duty he had to perform, of proposing that the thanks of the meeting be given to Mr. Ashworth for the very interesting and very instructive paper he had submitted to them that evening.

The vote of thanks was then passed.

Mr. HENRY ASHWORTH, in rising to respond to the vote of thanks, was desirous in the first instance to offer a few remarks upon the discussion. He said that Colonel Sykes had called in question the accuracy of some of his statements relating to India. In the remarks he had made upon the government of India, he had not put forward any statement that was not found in the most reliable publications relating to that country, and in those he had quoted he had purposely made selection of Mr. Mangles, the Chairman of the Directors, and Mr. Tucker, the Vice-Chairman. Therefore, if there was any error in the statements he had made, they had originated with the colleagues and co-directors of Colonel Sykes at the India Board. However, after the plain and straightforward manner in which Colonel Sykes's own statements had that evening been met and contradicted, there was no further need for remark upon them. Col. Sykes had endeavoured to convince the audience that the government of India had established a code of regulations relating to the holding of property, which he chose to consider unexceptionable, and he (Mr. Ashworth) was therefore desirous to submit to Col. Sykes one or two inquiries which would be held to indicate their success. First he would inquire what number of European settlers had availed themselves of this very unexceptionable land tenure in India during the 20 years which had elapsed since the terms had become so easy. [A call was raised for Col. Sykes, but it was found that he had left the meeting.] Mr. Ashworth remarked that he would have preferred the answer of Col. Sykes, but as he was not present, he (Mr. Ashworth) must answer his own question. According to statements publicly made, and referred to by the hon. member for Stockport, the entire number of European settlers in all India, not in the service of the Company, and not in the cities, was betwixt 300 and 400. Another question which he would have put to the gallant Colonel was, the amount and value of exports annually sent from India. Every one must be aware that one of the best practical tests of the prosperity of a country was its exports. How much of their produce could the people of India spare for other countries after having provided for their own wants? He was not at that moment familiar with the exact return of Indian exports, but he judged that they might be about 12 millions sterling. Did this indicate prosperity? He had that evening shown them that in the cotton manufactures there were 380,000 of our population identified with exports of 35 millions, whilst the 200 millions of population of India had been unable to export but little more than one-third of that amount. It was, therefore, evident that the attractions of improved tenure had failed to receive confidence, and that judging of the people by the paltry amount of their imports and exports, they must be in a most miserable condition. Mr. Ashworth then thanked the meeting for the patient attention they had given him, and for the kind manner in which they had appreciated the little effort he had made.

The Paper was illustrated by numerous specimens of Cotton in the raw and manufactured state.

The Secretary announced that on Wednesday evening next, the 17th inst., a Paper by Monsieur

F. R. de la Tréhonnais, "On the Past and Present of French Agriculture," would be read.

The following letter has been received by the Secretary since the meeting:—

SIR,—As I had not the opportunity of taking part in the discussion last night, I beg to call the attention of members to the measures now in progress for carrying out that important principle of the English colonisation of India. Mr. J. B. Smith well pointed out that European energy and enterprise, by means of immigration to healthy climates, was the great and effective step to the promotion of the growth of cotton, and of the development of the resources of India. In prosecution of this I beg leave to observe that the Chairman (Mr. R. W. Crawford) has undertaken to bring before the House of Commons the railway question, and on Tuesday next Mr. W. Ewart moves a Committee of Inquiry on colonisation. The subject of India has been so prominently taken up by this Society, that I trust these motions will meet the support of the parliamentary and other members.—I am, &c.,

HYDE CLARKE.

Northern Bengal Railway, 42, Basinghall-street,
March 11.

BUCKS AND BERKS LECTURERS' ASSOCIATION.

The Bucks and Berks Lecturers' Association was founded in 1854. A paper was read by the Rev. E. Hale, at a meeting of clergymen, in the neighbourhood of Windsor, giving an account of the Hants and Wilts Adult Education Society then recently established. It was determined the attempt should be made in the districts accessible from Windsor, and the Association started with the object "of promoting, especially in country villages, lectures, libraries, and reading-rooms."

The country Institutes find generally a great difficulty in procuring lecturers. Country lecturers, particularly gratuitous ones, are usually unsupplied with diagrams. Village reading-rooms, before they can be fairly started, require—

1. A small sum to provide the room with fixtures, &c.
2. A supply of lectures.
3. A supply of books for the exclusive use of the reading-room. These wants can be met by co-operation in almost any neighbourhood.

The Bucks and Berks Lecturers' Association first collected, as its name implies, a body of men willing to lecture. It then admitted as members, annual subscribers, and donors of £3 and upwards. Its funds were expended in making grants to village reading-rooms, in purchasing diagrams, &c., and in providing circulating libraries of 50 vols. each for the use of the Institutes or reading-rooms in Union.

The Association, considering the vast importance of night schools and evening classes in Institute, offers prizes for their encouragement. The following circular gives the scheme of prizes for this year:—

BUCKS AND BERKS LECTURERS' ASSOCIATION, 1857 AND 1858.—Patron: H.R.H. the Prince Consort. Notice to classes of Institutes and Reading Rooms, and to Night Schools in union with the Association.

1. A gratuity of £2 is offered to the Institute or Reading Room, whose members at any time during the winter have numbered 50, have the greatest number of pupils for classes, (in proportion to the number of members.)

2. A gratuity of £2 for the best kept register of an evening class, or night school.

N.B. The register sent in must be the one actually in use.

3. A present of books to the value of £1 to the pupil who has been absent from his class the fewest times in a course of not less than 4 months. In case of equality the greatest gross number of attendances to be taken.

N.B. Applications for these to be made not later than the 31st of March, 1858. A form of application will be forwarded.

The Association proposes to hold a central Examination, to be open to all members of the above Institutes, Reading-rooms, or Night-schools, in the month of April, 1858, and to give the following prizes:—

1. A present of books to the value of £2 to the member of an Institute, Reading-room, or Adult Class, who shall pass the best general Examination in the following subjects:—Arithmetic, (including Vulgar and Decimal Fractions, and the Rule of Three,) Euclid to the end of Prop. 12, Book I., Geography of the British Isles, History, (the leading facts and dates of the reign of George III.), Writing from Dictation, English Grammar, and Composition.

2. A present of books to the value of £1 to the next best.

3. A prize of £1 for the best Original Architectural Drawing done in a class, accompanied by a certificate from the teacher, of his belief that the design is original.

4. A present of books to the value of £1 for the best abstract or account of a Lecture, or course of Lectures, delivered during the season of 1857-58 in the Institute or Reading-room.

5. A present of books to the value of £1 for the best Original Essay on "The opportunities given to all classes in England for rising to eminence, illustrated by examples."

N.B.—For 3, 4, and 5, the papers sent in must be marked only with the initials of the candidate, but must be accompanied by an envelope containing on the outside the initials, in the inside the name and address of the candidates. The envelopes with the names of the unsuccessful candidates will be destroyed unopened.

6. A present of books to the value of £1 to the scholar of a night school whose writing shall show the greatest improvement during the winter.

The improvement to be judged of by copy-books selected by the manager of the school. There must not be more than one candidate from each class.

7. A present of books to the value of £1 to the scholar of a night school who shall pass the best examination in arithmetic—(first four rules, simple and compound reduction, rule of three, and vulgar fractions.)

8. A present of books to the value of £1 to the best reader among scholars of night schools.

Not more than one to be selected from each class.

N.B. All drawings, papers, and names of the candidates must be sent in to the secretary on or before the 31st of March, 1858, accompanied by a testimonial, signed by the secretary or manager of the institute or school, of general good conduct. The list of examiners and adjudicators will be forwarded hereafter with the date of examination.

E. HALE, *Hon. Sec.*

Institutes are admitted into Union with the Bucks and Berks Association on the payment of two guineas annually; this entitles them to six lectures.

Village reading-rooms, schools, and class-rooms, are taken into Union on the application of a member of the Association. Some 30 institutes, reading-rooms, and schools are now in Union with the Association. By still further extending its operations, and by the appointment of Local Secretaries, who will make known local wants and peculiarities, the Association trusts to carry out still more adequately than at present its original objects.

The Association is in Union with the Society of Arts, and hopes, through the Society's plan of Local Boards of Examiners, to find great aid in its educational work.

The Association is under the patronage of H.R.H. the Prince Consort, who has most warmly encouraged it, having presented it with £50 worth of books, and placed the reading-rooms and evening classes of his farm labourers in union with it.

The Association is also deeply indebted for valuable advice to the Hon. and Rev. S. Best, of the Hants and Wilts Education Society, and to James Hole, Esq., of the Yorkshire Union of Mechanics' Institutes.

The management of the Association is vested in a Committee. The Hon. Secretaries are the Rev. E. Hale, Eton College, and the Rev. T. H. Tooke, Upton-park, Slough.

HERBERT'S FLOATING BEACONS.

The following has been received from the editors of the *Mechanics' Magazine*:—

GENTLEMEN,—I find in the *Journal of the Society of Arts*, of March 5, the report of a paper read before the Society by Mr. Findlay, on English Lighthouses. Speaking of floating beacons, he says that a Mr. George Herbert has answered the conditions required for a floating light, which are, that it should keep upright, and be free from any violent oscillation. This is done, he goes on to say, by mooring the beacons, "which are of a circular plan, from their *centre of gravity*, which is so arranged as to be nearly or quite on the line of floatation." "Such buoys were brought into use by the Trinity Board in 1854, and perfectly fulfilled the condition proposed."

On turning to the *Mechanics' Magazine* for Nov. 24, 1855, (No. 1685), I find an account of a paper read by Mr. Herbert, on the construction of buoys, beacons, &c., in which he says that, with a view of obtaining a stationary floating body, which should have a tendency to ride easily, and to retain its perpendicularity, "a wrought-iron pear-shaped buoy was constructed, of a circular form in plan, and terminating above in an apex, so distributing the weight as that the centre of gravity should be situated a little below the centre of the plane of floatation, and the bottom was made concave and raised up internally, so as to form a cone, to the internal apex of which the mooring chain was attached."

The article goes on to say that "this quality of retaining its vertical position arose from the force of the tide or wave being simultaneously exerted upon one side of the exterior of the buoy, and on the opposite side of the interior cone; the forces so nearly balancing each other as to retain the floating body in an almost perpendicular position." Now, Sir, I do not doubt that buoys constructed in this way would float nearly upright, but I cannot believe that they would do so for the reason assigned above; nor can I think it necessary that the chain should be attached at the centre of gravity. The simple reason why they would retain their perpendicularity I conceive to be that the resultant force of the water against their sides, caused by a tideway or other current, would act through the point of attachment of the chain, not because the buoy was of a circular form in plan, but because it was *accidentally* a spherical surface below the water, as shown by the drawings, and the chain was attached at the centre of that sphere. And, so far as the *equilibrium* was concerned, the centre of gravity may have been anywhere in the vertical. For the sake of *stability*, however, it should be *below* the point of attachment, if possible. You seem to have pointed out the secret of success in this matter in your number for September 12, 1857,* containing an engraving

* AN IMPROVED FLOATING BUOY OR BEACON.

At page 485 of our 63rd volume, we published a description of an iron floating buoy or beacon, designed so as to ride easily, and remain perpendicular, or nearly so, in rough water. The essential feature of the improved buoy consisted of a conical hole in the centre, into which the chain used for mooring it rose, being made fast near the centre of gravity of the vessel. M. Trajano de Carvalho, a gentleman belonging to the Naval Architectural Department of the Imperial Brazilian Navy, having heard that this buoy was found in practice somewhat defective, has designed an improved buoy, with the same objects as in the former case, and has favoured us with a sketch of the same. M. Carvalho's buoy is represented in section in the annexed engraving.* It is spherical in form at the lower part, and it will be seen that the aperture in the bottom is dispensed with, the mooring chains being attached to a link at the bottom of a pair of rods, the upper extremities of which turn on pins or bolts. These pins or bolts are fitted at the height of the centre of the sphere of which the bottom of the vessel forms a part, and pass (for the sake of strength) into a cross beam, which, at the same

* The mast or pole of the beacon is considerably shortened in the engraving, to save our space.

ing of a buoy invented by M. Carvalho, which you describe as being spherical in form at the lower part, the mooring chains being attached to a link fitted at the height of the centre of the sphere, and the ballast so disposed as to cause the centre of gravity to fall below the centre of form. The buoy invented by this gentleman would not be liable to injury from the rub of the mooring chain, as Mr. Herbert's always must be.

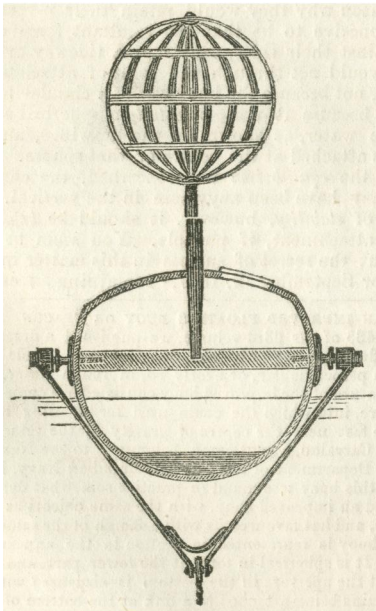
Trusting that you will use your scientific influence to have proper persons appointed to conduct any experiment which may be made with reference to this very important matter, so that a good idea may not be lost through its having fallen into feeble hands,

I am, Gentlemen, your obedient servant,
N. B.

March 6, 1858.

[The above letter of our correspondent, relating to the paper which appears on a former page of this number, directs attention to a very important point, and we feel it our duty to respond to the appeal made in its last paragraph. If official experiments are to be made with the improved beacons and lights, let there be no misconception as to the true principle of their construction. It appears to us unquestionable that our correspondent is right, and that Messrs. Findlay and Herbert are wrong. No scientific reason whatever can be assigned for the proposition which they put forward, viz., that a vessel, circular in plan, and moored at or near its centre of gravity, shall maintain perpendicularity in a stream or tideway; and Mr. Herbert's notion, that the action of the current upon the interior of the cone would tend to this result, is manifestly mistaken; for the very circumstance of the buoy being upright will effectually prevent any such action taking place. At the meeting of the Society of Arts, Mr. Findlay mentioned the fact

time, forms a step for the mast or pole. The beacon is formed of a series of hoops or half hoops, which may be painted red, to enable them to be better seen at a distance. The improved buoy is ballasted so that its centre of gravity falls below its centre of form, and if situated in a current, would swing across the tide,



and itself float upright, while the rods were inclined at an angle more or less great to the surface of the tide. Such a buoy would be particularly valuable in those Indian rivers where the current is strong, and in which it frequently happens that the existing buoys will not "watch," as it is termed—that is, keep upright and in sight.—(*Mechanics' Magazine*, September 12, 1857.)

that an experimental beacon, made on Mr. Herbert's principle, had been found, in rough weather, to oscillate through an angle of 10 deg.—about two-fifths of the angle described by an ordinary beacon. Nothing is more likely than that this amount of oscillation arose in great measure from neglect of the true principle to be observed, which, as "N. B." remarks, was indicated in our description of Mr. Carvalho's beacon, in September last. That principle is, that the moorings of the beacon should be attached to it at the height of the point at which the resultant pressure of the stream intersects the vertical axis of the beacon. (Here we, of course, neglect friction.) It is this condition which M. Carvalho fulfils in his beacon. With regard to the entire submersion of buoys by the action of strong currents, as mentioned by Mr. Findlay, we may remark, that the only way to remedy the evil is to increase the displacement of the buoys. We offer no apology for these comments, as we believe the success of the proposals which Messrs. Findlay and Herbert have so much at heart, depends upon the facts to which we here direct attention.—Eds. *Mechanics' Magazine*.]

SOUTH KENSINGTON MUSEUM.

During the week ending 6th March, 1858, the visitors have been as follows:—On Monday, Tuesday, and Saturday, free days, 2,044; on Monday and Tuesday, free evenings, 2,105. On the three Students' days (admission to the public 6d.), 472; one Students' evening, Wednesday, 48. Total 4,669.

Home Correspondence.

LIGHTHOUSES.

SIR,—In the discussion on Mr. Findlay's paper on Lighthouses, on Wednesday evening last, your reporter has in some way misunderstood me, and consequently has not reported my remarks quite correctly. He makes me say, "That I had the testimony of Mr. Brooking, one of the Newfoundland Light Commissioners, that a face of three of these deep reflectors was capable of being seen, in all states of the atmosphere, at a distance of over thirty miles, and I knew of no other description of reflector of which, with the same number of faces, the same results could be recorded." What I really did say, was, "That I had the authority of Mr. Brooking, one of the Newfoundland Lighthouse Commissioners, that a light, with three of these deep reflectors on a face, could be seen over thirty miles in the ordinary state of the atmosphere, and I did not think the same could be said of the Huddart reflector, with only the same number on a face."

I am, Sir, your very obedient servant,

WM. MATTHEWS.

367, Strand, London, March 8, 1858.

NEW ZEALAND AND ITS RESOURCES.

SIR,—In the discussion which ensued on Mr. Stones' paper on New Zealand, my friend Mr. Sidney rather questioned my statement of its grazing capabilities, remarking:—"He would also warn intending emigrants against the idea that, whereas, without cultivation, they could feed three sheep per acre, with cultivation, they could feed six sheep per acre. Those were statements, he apprehended, taken from New Zealand hand-books. The fact was, that the land best adapted for sheep-feeding was just that which was not fit for cultivation, &c."

I may be permitted, in corroboration of my remarks, which were derived from New Zealand colonists and New Zealand journals, and not from hand-books or over-drawn statements, to quote an extract of a letter I have

just received from my brother, who writes to me from Plymouth, as follows:—

"I have read the paper of Mr. Stones, and your remarks, &c., and think them very good, and certainly unbiassed. With respect to the wool, I have heard at Sydney that the New Zealand wool is very much superior to the Australian, from the fact that the wool never stops growing, as sometimes occurs in New South Wales and other parts of Australia; therefore, the fibre is of uniform thickness throughout, and fetches a higher price in the market. I know one place, Pakaraka—Archdeacon Williams's place,—near the Bay of Islands, where eight sheep are fed all the year round on one acre of pasture land, sown with English grasses. I have seen and know this myself. I intend sending a copy of the *Journal* to my friends at Auckland, and the paper will appear in the local journals."

This statement will, I think, bear out the opinions I advanced.

I am, &c.,

PETER L. SIMMONDS.

8, Winchester street, Pimlico, March 4, 1858.

STEEL-BORED ORDNANCE.

SIR,—Absence from home prevented my seeing Mr. H. W. Reveley's remarks in the *Journal* of the 5th Feb. sooner. I am sorry to say I can see nothing in that gentleman's letter to induce me to alter the opinions expressed by me on the 29th Jan.

With your permission I will examine more closely into the merits of Mr. Reveley's plan. I stated that "the welding of such a mass of steel was open to serious objections." Mr. Reveley corrects me on this head, and in support of his theory, instances the welding of ordinary gun barrels. The ordinary barrels are not welded from a spiral coil, but from a flat iron bar, called a "scelp," 18 inches long, six inches wide, by half-inch thick; this "scelp" is passed through elliptical rolls, and drawn taper, then through a series of grooved rolls and brought into a cylindrical state, and afterwards welded on a cold mandril by passing through elliptical grooved rollers; the barrels thus treated are passed through the rolls fourteen times, and are heated each time; the barrels of all the ordnance rifles are made in this way; sporting gun barrels and the better class of barrels are made from a spiral coil, a plan which is, as Mr. Reveley justly remarks, extremely simple, and they are welded at one heat by "jumping;" a barrel made in the way described weighs in the rough, some 8 or 10 lbs., and measures 30 or 40 inches in length, as the case may be, these being the standard lengths of the Enfield rifle barrel. These barrels are all made of malleable iron or iron and spring steel; a barrel of cast-steel is a rare exception in this country, but common in America, where they are bored out of the solid bar.

The spiral bore Mr. Reveley proposes to employ in the manufacture of his large ordnance will weigh upwards of four tons measuring 12 feet in length, by 18 inches in diameter in the finished coil. To form this spiral, a bar of steel would be required 162 feet long by four inches square; we will conceive this mass of steel in a coil, ready for the welding operation. A furnace is required to heat it in at least 14 feet long, and it must be borne in mind that it is not the surface only that must be brought to a welding heat, but the edges of the coil, and this, too, uniformly throughout; a little too much heat in any one part damages the whole; if underheated, no weld takes place. If it is proposed to weld it piecemeal, a portion of the previous welded part must be brought up a second time to a white heat. The "jumping" of four tons of steel will not be such an easy or simple matter as "jumping" a gun barrel weighing 10 lbs.; some machinery must be employed to lift it, and the probability is, that by the time it is ready for the "jump," the metal will be too cold to adhere. I think I need not point out to Mr. Reveley that the surface will be in a welding state long before the sides.

We next come to the crystallisation of the surface.

Mr. Reveley says, "large quantities of chilled cast-iron are used for a variety of purposes, and I never yet saw the iron mould affected by the melted metal." This statement is beyond question, but I cannot see any ground of comparison between chilled cast-iron and the question at issue. By pouring cast-iron into a metal mould, the temperature of the iron in immediate contact with the mould is instantly lowered, but not so with the internal iron; the "chilling" does not penetrate beyond an inch or an inch and a half, and for some time the metal internally remains in a fluid state. I presume Mr. Reveley would cast the "jacket" round the bore in sand, and heat the bore before placing it in the moulding box, to prevent "chilling," which would be destructive to the "jacket;" if not heated, two errors will be fallen into—first, the metal will be chilled and its brittleness increased, and secondly, it will rend in various places for, while the cast-iron is contracting the steel is expanding. Whatever the treatment may be, the result will be the crystallisation of the outer surface of the coil; to prove this, Mr. Reveley has only to take a bar of such steel as he purposes to employ for his coil, and then plunge it into a ladle of molten cast-iron, and then test the result. Of course it must be left in the ladle till the iron is set.

In treating of the shrinkage. I cannot admit that the core "is at a low degree of heat;" it must be brought up to the same temperature as the surrounding fluid, and the particles of steel on the outer surface of the coil will be expanded to their utmost limit, thus bringing it again into the same—if not a worse—state than unhammered cast-steel. Both cool together, the steel contracting in a greater ratio than the iron—but whether so great as to be seriously detrimental to the supposed ordnance, actual test alone can decide.

We now come to my own experimental cannon. I am sorry I did not express myself so clearly on the method of construction as to prevent any wrong impression being entertained by Mr. Reveley. The bore was cast hollow, four inches square, and was hammered or, if Mr. Reveley prefers the term, drawn, down on a mandril to 2½ inches diameter, cold-hammering being carefully avoided: this gave it its full cohesive strength.

I am, &c.,

W. HAWKSWORTH.

Arvon Steel and Iron Works, near Lidlithgow,
Feb. 15, 1858.

STEAM PLOUGHING.

SIR,—Allow me to inform Mr. Homersham that the Stirlingshire Agricultural Society's judges are in error, for I have ploughed the whole of fields without shifting. As an instance of what I am prepared to do, and publicly, if required, I will take a field on my own farm (it contains 13 acres, with one straight and three not straight fences), I will set the engine, windlass and tackle down, and plough the whole of it, including the headlands, without shifting the engine and windlass, leaving less in the four corners than is usually left when ploughing is done with horses.

I am, &c.,

W. SMITH.

Woolston, Feb. 22, 1858.

MEETINGS FOR THE ENSUING WEEK.

- MON. Royal Inst., 3. Prof. Huxley, "On Biology." Statistical, 3. Anniversary. United Service Inst., 8½. I. Mr. H. D. Cunningham, "On the History of Sails and Sail Power, and on Cunningham's Improvements in Reefing Sails." II. Mr. G. Biddlecombe, R.N., "On Steam Navy Tactics."
- TUES. Royal Inst., 3. Prof. Huxley, "On Biology." Civil Engineers, 8. Renewal Discussion, "On Submerging and Repairing Submarine Telegraphic Cables." Statistical, 8. Mr. W. A. Wilkinson, "On Railway Terminal Accommodation, and its effects on Traffic Results." Pathological, 8.

- WED. United Service Inst., 3. Capt. Fishbourne, "On the *Levia-than* Steam Ship."
London Inst., 7.
Society of Arts, 8. Mons. F. R. de la Tréhouais, "On the Past and Present of French Agriculture."
Microscopical, 8.
THURS. Royal Inst., 3. Prof. Tyndall, "On Heat."
Philosophical Club, 5½.
Antiquaries, 8.
Chemical, 8. Messrs. Perkin and Duppa, "On the Action of Bromine upon Acetic Acid."
Linnean, 8.
Philological, 8.
Royal, 8½.
FRI. United Service Inst., 3. Mons. Soyer, "Military Dietetics, or improved System of Cooking for Army and Navy."
Royal Inst., 8½. Mr. Henry Thomas Buckle, "On the Influence of Women on the Progress of Knowledge."
SAT. Asiatic, 2.
Royal Inst., 3. Prof. Bloxam, "On the Chemistry of the Elements which circulate in Nature."
Medical, 8.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette, March 5, 1858.]

Dated 10th February, 1858.

247. G. Richardson, 2, Cope-hagen-street, Islington, and W. Richardson, 6, Ranelagh-grove, Pimlico—The construction of three-wheeled carriages, and omnibuses so constructed, as to be called first-class omnibuses.

Dated 15th February, 1858.

254. P. Molinari, Marseilles, France—An improved composition, to be used externally, for preventing sea sickness and illness arising from similar causes.

Dated 18th February, 1858.

307. E. Cuvelier, Arras, France—Improvements in steam engines.
309. W. E. Newton, 66, Chancery-lane—An improved optical instrument, which the inventor denominates a "Tropescope." (A com.)
311. J. H. Johnson, 47, Lincoln's-inn fields—Improvements in machinery or apparatus for making bolts and rivets. (A com.)
313. H. Blair, Kearsley, Lancashire—Certain improvements in the method of recovering the sulphur which has been used in the manufacture of soda ash, and in the apparatus connected therewith.

Dated 19th February, 1857.

315. J. Beatti, Lawn-place, South Lambeth—Improvements in locomotive and other steam engines, parts of which improvements are respectively applicable to other purposes.
317. J. Syers, Liverpool—Improvements in the decomposition of salt, and in the abstracting of metals from their ores.
319. R. Griffiths, 69, Mornington-road, Regent's-park—Improvements in screw propellers, and apparatus for governing engines used to give motion to screw propellers.
321. T. Brazenor senr., and G. Brazenor, junr., Birmingham—Certain improvements in mill bands.
323. J. E. Cook, Greenock—Improvements in binnacles or apparatus for holding marine compasses.
325. W. Clark, 53, Chancery-lane—Improvements in filtering water, and in apparatus for the same. (A com.)

Dated 20th February, 1858.

327. R. Little, Glasgow—Improvements in machinery or apparatus for washing and mangling.
329. W. Thomson, Glasgow—Improvements in testing and working electric telegraphs.
331. G. Gentile, 41A, Queen street, Cheapside—Improvements in ornamenting lace, netted, knitted, and woven fabrics.
332. F. M. Baudouin, Paris—Improvements in electric telegraph cables.
335. H. Rey Rimels, Brussels—A new process of manufacturing potato meal or f. cula.
337. W. Clark, 53, Chancery-lane—An improved rotary engine. (A com.)
339. G. Catlin, Brussels—Improvements in the construction and propelling of steamers.

Dated 22nd February, 1858.

341. G. Schaub, Birmingham—A new or improved manufacture of certain kinds of printing type and other printing surfaces.

343. W. Cory, jun., Gordon place, Gordon-square—An improvement in the manufacture of artificial fuel.
345. R. A. Brooman, 166, Fleet-street—An improvement in treating ores of precious metals. (A com.)
347. J. Potts, 24, Park-street, Southwark—Improvements in machinery for cutting and shaping toothed gearing.

Dated 23rd February, 1858.

349. R. Telford and M. Hope, Birmingham—Improvements in castors for furniture.
351. W. McLennan, Glasgow—Improvements in the manufacture or production of boots, shoes, and other coverings for the feet.
353. E. Shepard, Jermyn-street, St. James—An improvement or improvements in depositing metals and metallic alloys by electricity.
355. G. F. White, Mark-lane—Improvements in doors and other locks.
357. W. E. Newton, 66, Chancery-lane—An improved process for producing photographic pictures or designs on the surface of stone or metals, so that impressions may be taken therefrom by the process of lithographic printing. (A com.)

Dated 24th February, 1858.

359. S. Smith, Hyson Green Works, near Nottingham—Improvements in apparatus for insuring the correct action of the safety valves of steam boilers.
361. A. Hector, St. Cyrus, Kincardine. N.B.—Improvements in apparatus for taking or catching fish.
363. C. Girardet, Vienna—A new moveable shaft bearer, or supporter of coaches.
365. J. Petrie, Rochdale—Improvements in apparatus for regulating the flow of steam.
367. W. E. Newton, 66, Chancery lane—The application to carts or other vehicles of apparatus for weighing the load contained in such vehicles. (A com.)
369. H. Browning, Avon-cottage, Clifton road, Bristol—An improved composition for covering iron and other ships' bottoms and other surfaces.
371. R. F. Miller, Hammersmith—Improvements in omnibuses.

INVENTIONS WITH COMPLETE SPECIFICATION FILED.

370. W. K. Foster, State of Maine, U.S.—An improvement in the manufacture of blades for pencil sharpeners or other articles of like nature.—24th February, 1858.
380. A. J. Dessales, 13, Rue des Enfants Rouges, Paris—Improvements in oil lamps for railway carriages, ships' cabins, and other purposes.—27th February, 1858.

WEEKLY LIST OF PATENTS SEALED.

March 5th.

2336. U. Scott.
2341. B. Sharpe.
2351. J. Eastwood and S. Lloyd.
2361. J. D. Dunncliff.
2363. W. Crofts.
2389. J. Walmsley and T. Howard.
2409. E. Hayes.
2428. G. E. Dering.
2431. J. W. Burton and G. Pyc.
2435. M. R. Levenson.
2439. W. H. Peake.
2466. M. Henry.
2487. G. Speight.
2513. R. Thompson and W. J. Nicholson.
2603. H. Edwards.
2633. Capt. G. Rhodes.
2831. A. René le Mire de Normandy.
2939. G. T. Bousfield.

3067. J. M. Préaud.
3107. J. B. Howell and J. Shortridge.
3137. A. René le Mire de Normandy.
3173. J. Wandsworth.
37. T. Greenwood and J. Batley.

March 9th.

2350. E. Lavender.
2353. H. Lawford.
2357. W. Jamieson.
2358. J. Fenton, W. Thomson, and T. Snowdon.
2364. G. Bruninghaus.
2367. J. Mills.
2370. S. Colbeck and W. H. Colbeck.
2386. A. Gray.
2442. J. Minnitt.
3185. F. O. Ward.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

March 1st.

478. R. Boby and T. C. Bridgman.
488. A. L. Garnier.

March 2nd.

466. W. G. H. Taunton.
481. C. Iles.
489. J. Lewis.
501. W. Lister.

March 3rd.

486. A. Hotchkiss.
562. H. D. Pochin.

March 5th.

504. J. Cooper.
605. William Weild.
522. J. Norton.

March 6th.

525. J. Bernard.
529. J. Bullough.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
4064	March 4.	Self-acting Valve Ventilator	R. Ramage	55A, Holywell-st., Milbank, Westminster.
4065	" 9.	Improved Gas or Air-pressure Gauge	W. Reichenbach	33 & 31, Borough-road, Southwark.
4066	" 10.	Metal for Forks, Spoons, and Ladles.....	R. F. Sturges	Birmingham.